AUGUST, 1951

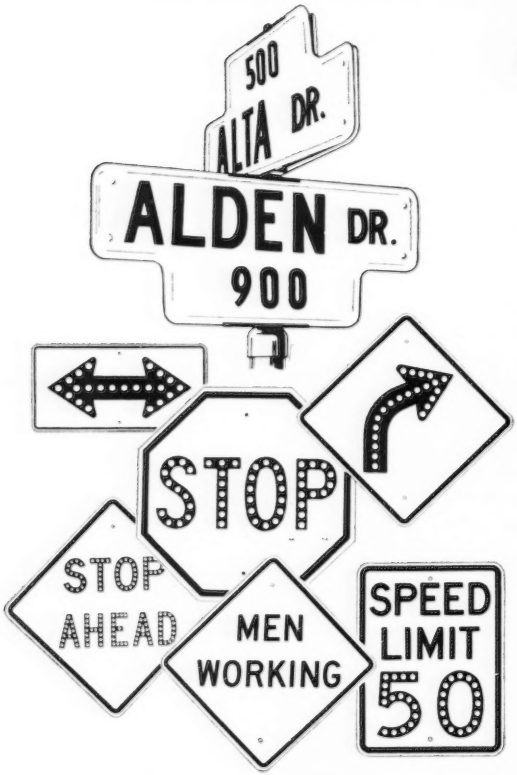
Traffic Engineering

The Roebling Suspension Bridge in Cincinnati, Ohio

- Development of Traffic Engineering in Cincinnati
- Underground Garage in Los Angeles
- A Nomograph for Urban Traffic Signal Priorities
- Public Support and Traffic Engineering
- A Deceleration Lane Study

Official Publication of the Institute of Traffic Engineers

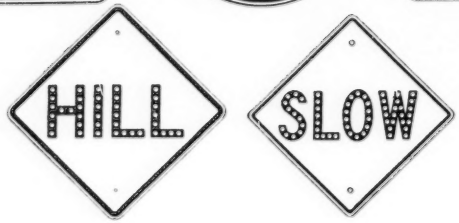
TO EFFECTIVE TRAFFIC CONTROL.....



Grote SIGNS

Here are high-visibility signs for practically every traffic control need; Street name plates for instant recognition of name and number; parking signs that politely enforce traffic control; road signs to improve highway safety. Built for years of dependable, long-wear service, all GROTE Signs are made of heavy, zinc coated, Bonderized steel, finished with special baked enamel processes that make them permanently bright and attractive — that resists the action of weather, salt spray, smoke or airborne chemicals. All are made to the Grote high standards of manufacture and conform to the accepted official standards and recommended uniform sign systems. For economy purchase and installation, always specify Grote Signs.

Send for our 1951 catalog of
Modern Signs for Modern Communities.



THE Grote MFG. CO., INC.
Grote Square
BELLEVUE, KENTUCKY
Opposite Cincinnati

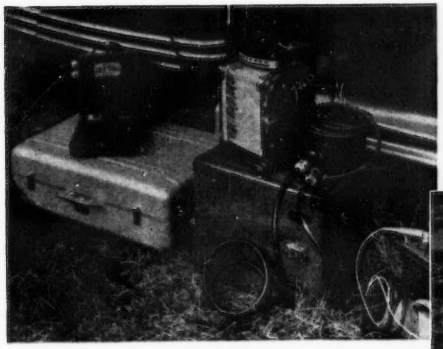
ELECTRO-MATIC
Speed Meter

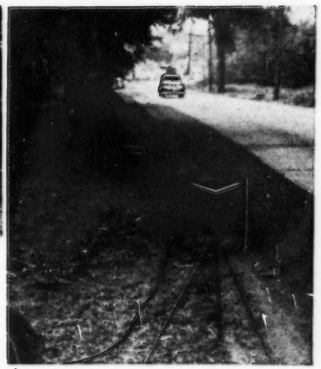
Model S-1 Electro-Matic *Speed Meter* measures the speed of moving vehicles from 0 to 100 m.p.h. This precision instrument operates with radio-frequency microwaves and is accurate within 2 m.p.h. A *Graphic Recorder* is connected in circuit with the *Speed Meter* when a permanent speed reading record is desired.

The instrument is quickly set up and connected, ready for operation after a minute or so for heating tubes. Under average conditions operating zone is about 150 ft. in advance of Antenna Unit. Continuous speed measurement is made of vehicles moving within the direct microwave radiation path.

For operating convenience, the *Speed Meter* is in 3 parts: Antenna Unit, Indicator Unit, Power Unit. The Antenna Unit is beamed at oncoming or receding traffic and may be located in a parked car or set up near the roadway. At the convenience of the operator the Indicator Unit and the Power Unit may be placed within or without the car. An aluminum carrying case is provided to contain the 3 units and connecting cables—total weight about 45 lbs.

The *Speed Meter* operates from a 6 volt automobile battery (8 amp drain) or from a 120 volt 50-60 cycle AC supply (50 watt rating). The *Graphic Recorder* is spring wound, has a capacity of 100 ft. of tape and operates at a speed of 1½ inches per minute.





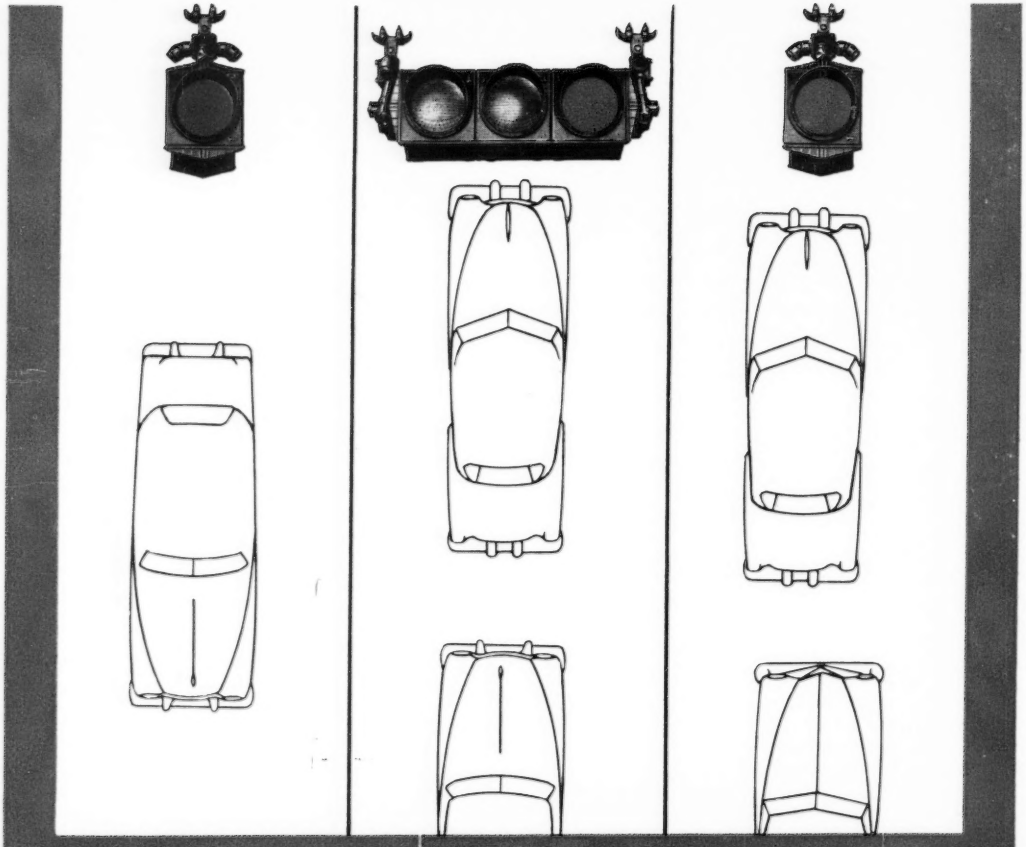
★ Microwave Accuracy
★ Car Battery Operation
★ No Road Tubes or Wires
★ Easy Portability

Send for Speed Meter Literature

Automatic Signal Division
EASTERN INDUSTRIES INCORPORATED
In Canada, write to: Northern Electric Co., Ltd., Belleville, Ontario

TRAFFIC ACTUATED ®

NORWALK, CONNECTICUT



CROUSE-HINDS Lane Direction Signals

increase rush-hour roadway capacity as much as 100%

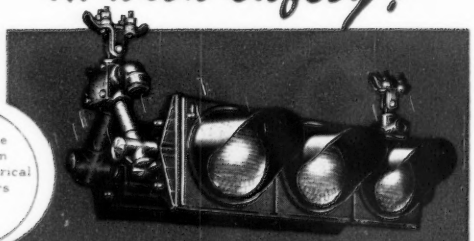
... with safety!

Roadways which were adequate to handle the traffic volume of ten years ago are now overloaded with a heavy traffic flow in one direction during certain hours. At other times the direction of heaviest flow may be reversed.

Crouse-Hinds Lane Direction Traffic Signals and Controllers have been developed to relieve this type of congestion . . . with safety!

They are two-way units suspended above each lane at mid-block locations, controlling the direction of traffic in all lanes of a street or highway. The signals display a green indication facing the traffic movement while the opposite faces display a red indication. The direction of traffic in any lane can easily be changed by reversing the signal indications. In this way, a majority of traffic lanes can be used in the direction of the heaviest movement, thus greatly increasing the capacity of the roadway. When the peak load has passed, the center lanes can be returned to their normal function as passing lanes by displaying an amber indication on both faces of such signals.

Write for additional information.



CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas
Denver — Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Milwaukee
Minneapolis — New York — Philadelphia — Pittsburgh — Portland, Ore. — San Francisco
Seattle — St. Louis — Washington. Resident Representatives: Albany
Atlanta — Baltimore — Charlotte — New Orleans — Richmond, Va.
CROUSE-HINDS COMPANY OF CANADA, LTD., TORONTO, ONT.

A Nationwide Distribution Through Electrical Wholesalers

TRAFFIC SIGNALS · CONDULETS · FLOODLIGHTS · AIRPORT LIGHTING

Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

VOLUME XXI | AUGUST, 1951 | NUMBER 11

COVER: The new Sixth Street Viaduct in Cincinnati, Ohio, provides improved connections for U. S. 50 and access between downtown Cincinnati and the Western Hills area.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

INSTITUTE OFFICERS

HARRY E. NEAL
President

NATHAN CHERNIACK
Vice-President

F. B. CRANDALL
Vice-President

HARRY PORTER JR.
Secretary-Treasurer

PUBLICATION STAFF

FRED W. HURD
Editor

ANN S. LINCOLN
Managing Editor

Associate Technical Editors
ROBERT S. HOLMES, EDMUND R. RICKER
MARTIN C. STARK

Associate Editors
H. A. BARNES — R. H. HARLESTON JR.
J. A. CARROTHERS — C. S. LECRAW JR.
C. C. CLARK — EUGENE MAIER
ARTHUR C. GIBSON — S. T. SIEGEL
MARGARET WOOLVERTON

May We Offer . . .

Tentative Program—Annual Meeting, Institute of Traffic Engineers 363

Development of Traffic Engineering in Cincinnati 364
George W. Howie

Underground Garage in Los Angeles 368
Downtown Business Men's Association

A Nomograph for Urban Traffic Signal Priorities 370
F. Houston Wynn

Public Support and Traffic Engineering 373
Maxwell Halsey

A Deceleration Lane Study 377
J. V. Miller Jr.

Traffic Trends 379

Traffic News 380

Looking Ahead 388

Index to Advertisers ..... Inside Back Cover

Published Monthly by the

Institute of Traffic Engineers

PUBLICATION office:
Interstate Printing Corp.
400 Watchung Avenue
Plainfield, New Jersey

EDITORIAL AND ADVERTISING offices:
Strathcona Hall
New Haven 11, Connecticut

Entered as second-class matter November 7, 1941, at the Post Office at Plainfield, New Jersey, under Act of March 3, 1879. ¶Single copies 40 cents, subscription price $3.50 per year in the United States; $2.00 per year to members. Other publications of the **Institute of Traffic Engineers** include Annual Proceedings, Traffic Engineering Handbook and Technical Bulletins. **¶The Institute is not responsible for any statements made or opinions expressed in its publications.** Permission to reprint contents with customary credit line is given unless otherwise stated.

DUALS WIN OUT in Cincinnati, too!

3,000 more ordered after comparative tests!

WHEN Cincinnati decided to expand and modernize its metered parking system, meters of different makes went "on trial". 400 Duals were included. Result? City officials ordered 3,000 *more* Duals to complete the current program.

You can see easily why Duals win such preference—in city after city, from coast-to-coast. Duals have the *extra* advantages that give the maximum in dependable, low-cost performance. They operate simply, automatically—in any weather. Maintenance stays down—revenue stays up.

And with Dual *gearshift* meters, your city can enjoy flexible parking control; time and coin conversions can be made as conditions require, on the spot.

If your city plans to modernize or install metered parking, see how much *more* Duals can give you. Send for complete information. Write for Bulletin DU-504 for on-street parking; Bulletin DU-505 for off-street parking.

0 10 20 30 40 50 60
INSERT COIN
1 HOUR
1 TO 5 PENNIES OR 1 NICKEL
9 A.M. TO 6 P.M.
SUNDAYS AND HOLIDAYS EXCEPTED
555
Eventually you'll pay for the best
Get the best NOW . . .
GET DUAL AUTOMATICS!

THE DUAL PARKING METER COMPANY
A subsidiary of The Union Metal Manufacturing Company
Canton 2, Ohio

Frankly Speaking

THE tentative program of our 22nd Annual Meeting will be found in this issue of "Traffic Engineering" magazine. Technical sessions on Regulations, Control Devices, Design, Planning, and Traffic Education will be held. Both city and rural highway transportation problems will be reviewed. Current practices, both new and old, will be discussed.

In a profession which is developing as rapidly as traffic engineering, one cannot afford to "drift along." Frequent contacts with fellow engineers is required if each of us is to keep pace with the field. The Annual Meeting of the *Institue*, each year, is the "mixing bowl" of traffic engineering culture. Ideas and experiences are exchanged and many men return to their jobs with new insight and inspiration to solve their most perplexing traffic problems. Public officials in states and cities could make no better investment than to send one or more of their traffic men to the Annual Meeting—and attend themselves.

Important matters will be settled at the Annual Business Meeting. New Officers will be installed, committee work will be reviewed and proposed changes in the Constitution and By-Laws will be discussed. The Business Meeting is the only session limited to the membership; if you are entitled to vote, your attendance is imperative.

Los Angeles is an excellent laboratory of traffic engineering practices. A few of the "traffic engineering at work" items are: the Arroyo Seco Parkway, off center traffic control, the famous four level grade separation on the Hollywood Freeway and construction on the Pershing Square underground garage. Many modern installations of traffic controls and lighting are to be seen in the city and vicinity.

Everyone is welcome to attend the Annual Meeting of the *Institute*. Anyone interested in highway transportation and related fields will profit immeasurably by attending. We are looking forward to seeing you in Los Angeles in September.

Fred W. Hurd
Executive Secretary

PRISMO SIGN KIT

PRIMSO REFLECTO KIT

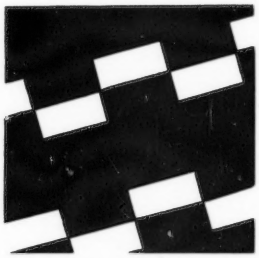
PRISMO PRODUCTS

REFLECTIVE TRAFFIC PAINTS FOR LONG RUN ECONOMY AND RELIABILITY

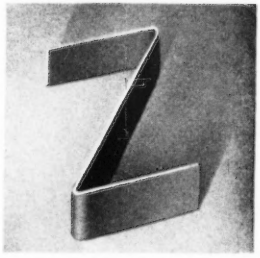
. . . PROVEN BY OVER 12 YEARS TEST!

Experienced road maintenance executives realize that Prismo Products carry a *plus factor*. It is the *know how* of Prismo development technicians based upon years of painstaking research, testing and resulting product improvement. Prismo Products constantly undergo actual road trials under the severest weather and road conditions. The *plus factor* of Prismo Products . . . in other words the *know how* of the Prismo Safety Corporation pays you dividends in longer wear and absolute reliability.

The new Reflecto Kit offers the most efficient reflective type of material on the market. A combination of the toughest plastic binder available and millions of tiny reflective spheres. The combination greatly increases the reflective brilliance and wearability of Prismo road markings. Both the Prismo Reflecto-Kit and Prismo Sign Kit reflectorize road markings and signs with a minimum of application effort. They are easily applicable by brush, roller, spray or silk screen method. Prismo Plastix are sections of brightly reflective plastic which are permanently affixed to pavement by a strong plastic binder. Plastix make efficient and long lasting cross walk and other pavement markings. Zee-Gards protect freshly painted lifelines and road and street markings.



PRISMO PLASTIX



PRISMO ZEE-GARDS

PRISMO LIFE LINE

A reflective center line that outwears other traffic paint by 3 to 5 times. Prismo Lifeline is absolutely reliable under the toughest traffic and weather conditions.

Write today for full descriptive material on all Prismo Products . . .

the SPHERE of SAFETY

PRISMO SAFETY CORPORATION

HUNTINGDON, PENNA.

22nd Annual Meeting - I T E

Tentative Program

Ambassador Hotel, Los Angeles, California, September 23-27, 1951

Sunday, September 23, 1951

Afternoon:
Board of Directors Meeting
Technical Committee Meeting
Registration—Hotel Lobby

Monday, September 24, 1951

Morning:
Registration
Board of Directors Meeting
Technical Committee Meetings

Afternoon:
Annual Business Meeting

Evening:
Motion Picture Studio Tour (Ladies only)
Fun—Relaxation—Dancing in "Headquarters" Room
Past Presidents' Dinner

Tuesday, September 25, 1951

Morning:
Biscuit Banter Breakfast
Opening General Session
Presiding: Nathan Cherniack, Transportation Economist, Port of New York Authority
Welcome to Delegates—Fletcher Bowron, Mayor, Los Angeles; Oscar A. Trippet, President, Los Angeles C. of C.; Roger W. Jessup, Ch'man, L. A. Co. Bd. of Supervisors

Technical Session One
TRAFFIC ENGINEERING AND ENFORCEMENT ARE A TEAM

Presiding: W. S. Smith, Assoc. Dir., Bur. Hwy. Traf., Yale U.
1. The Engineer and Officer Work Together
   William H. Parker, Chief, L. A. Police Department
2. Enforcement Must Be Planned For
   James A. Pryde, Chief, Washington State Patrol
3. The Role of the Traffic Engineer
   Robert S. Holmes, Dep. Dir., Engineering Service Div., Federal Civil Defense Adm.

Noon:
Fashion Show Luncheon (Ladies only)
Luncheon Meetings—Greater Los Angeles Chapter, National Safety Council. Yale Bureau Grads Luncheon

Afternoon:

Technical Session Two
PLANNING PROTECTS THE ENGINEERING INVESTMENT

Presiding: Roy E. Jorgensen, Engineering Counsel, National Highway Users Conference, Inc.
1. Planning Values of Origin-Destination Data Philadelphia-Camden Area Traffic Survey
   Paul Croley, Planning Comm., Philadelphia; H. G. Van Riper, Planning & Traffic Engr., Pa. Dept. of Hwys.
2. Highway Design and the Business Community
   Edw. T. Telford, Engr. of Design, Cal. Div. of Hwys.
3. Mass Transit Planning
   William R. McConochie, Chief of Traffic and Transportation Planning, De Leuw, Cather and Company
4. Planning Studies for the Delaware River Bridge
   Wm. J. Miller Jr., Traf. & Plann. Engr., State of Dela.

Evening:
Radio and Television Studio Parties
Fun—Relaxation—Dancing in "Headquarters" Room

Wednesday, September 26, 1951

Morning:

Technical Session Three
IS TRAFFIC ENGINEERING EDUCATION AND RESEARCH MEETING THE NEED?

Presiding: Joseph L. Wehmeyer, Safety and Traffic Engineer, Board of Wayne County Road Commissioners, Michigan
1. Professional Registration of Traffic Engineers
   J. C. Young, Traffic Engineer, Cal. Div. of Hwys.
2. Educational Requirements for Traffic Engineers
   Dr. Donald S. Berry, Asst. Dir., Institute of Transportation and Traffic Engineering, Univ. of California
3. Education and Research at the Institute of Transportation and Traffic Engineering
   Harmer E. Davis, Dir., Institute of Transportation and Traffic Engineering, University of California
4. Current Research at Yale Univ. Bureau of Hwy. Traffic
   Speaker to be announced
5. Speed, Headway, and Volume Relationships on a Six-Lane Freeway
   Dr. Theodore W. Forbes, Visiting Assoc. Prof. of Engr. and Psychology, University of California

Afternoon:

Technical Session Four
TRAFFIC ENGINEERING AROUND THE NATION

Presiding: F. B. Crandall, Traffic Engineer, Oregon State Highway Department
1. Denver Installs a Modern Signal System
   Henry A. Barnes, Traffic Engineer, City of Denver
2. Detroit Analyzes its Transportation Administration
   D. Grant Mickle, Dir., Traffic Engr. Div., Automotive Safety Found.; Alger F. Malo, City Traf. Engr. Detroit
3. Is Traffic Engineering Keeping Pace?
   Moderator: Sidney J. Williams, Asst. to the President, National Safety Council
   Affirmative: Burton W. Marsh, Dir., Traffic Engineering and Safety, American Automobile Assn.; T. T. Wiley, Deputy Comm. of Traffic, New York City
   Negative: Thomas J. Seburn, Traffic Engr., Kansas City; Henry K. Evans, Highway Trans. Specialist, U. S. Chamber of Commerce
   General Discussion

Evening:
Annual Banquet and after the Banquet
Fun—Relaxation—Dancing in "Headquarters" Room

Thursday, September 27, 1951

Morning:

Technical Session Five
THE TRAFFIC PROBLEM IN METROPOLITAN LOS ANGELES—AN INTRODUCTION TO THE TECHNICAL FIELD TRIP

Presiding: F. M. Carter, Asst. Traf. Engr., Cal. Div. of Hwys.
1. The Unincorporated Area Tackles the Problem
   Sam R. Kennedy, Road Commissioner, Los Angeles County Road Department
2. "Off-Center" Aids the City Solution
   Ralph T. Dorsey, Traffic Engr., Los Angeles, and Staff
3. The Freeway System of the Area
   Paul O. Harding, Assistant State Highway Engineer in charge of Los Angeles District Office

Afternoon:

TECHNICAL FIELD TRIP

Presiding: LeRoy R. Smith Jr., Highway Supt., State Div. of Hwys.; Harry Parker, Traffic Engineering Aid, Los Angeles County Road Department

Photo by Green & Tillett

Ambassador Hotel swimming pool.

Photo by "Dick" Whittington

Ambassador Hotel, East view.

Photo by "Dick" Whittington

Ambassador Hotel Cocoanut Grove.

Development of Traffic Engineering in Cincinnati

By George W. Howie (Mem., ITE)
Traffic Engineer, Cincinnati, Ohio

This is the third article on "Putting Traffic Engineering to Work" written by City Traffic Engineers. Mr. Howie became the Traffic Engineer of Cincinnati in 1949. He was formerly the Assistant Traffic Engineer of Portland, Oregon.

In the opinion of the Editor, this article presents a typical example of the problems confronting Traffic Engineering Departments in cities where traffic functions are not unified. However, in spite of this, it is apparent that traffic engineering is making rapid progress in Cincinnati.

IN order to understand how traffic engineering serves Cincinnati, some knowledge of the city is needed, for Cincinnati probably presents a greater variety of problems for the traffic engineer than most other American cities.

Many of these problems are typical: narrow, overloaded streets; lack of off-street loading and parking space; obsolete traffic control devices; and tight budgets.

Topographical Problems

"The City of Seven Hills" complicates these typical problems with many natural and man-made conditions. Rough terrain, outside the central business district, results in a through street system which literally "stands on edge." Numerous grades range from 6% to 12%, and nearly every main thoroughfare has grades which force loaded trucks to use compound low. All of these through streets wind successively over hills and through valleys. The longest piece of uncurved through street in the area is 13,000 feet and there are only ten tangents of one mile length in the entire system.

Commenting upon these facts, the Master Plan states: "While the series of hills and valleys adds a quality to the metropolitan area which agreeably distinguishes it from areas characterized by mile after mile of level terrain, the irregular land surface presents difficulties to that process which deals with the use of land."

Many of the steep hillsides are unsuited for business or residential development with the result that metropolitan Cincinnati consists essentially of a series of smaller communities united by the through street system and with the central business district and various industrial areas acting as the focal points.

There are heavy concentrations of land use in those areas suitable for development.

Cincinnati officially has a population of 500,510. For practical purposes, one must, however, deal with a population of 750,000. The city completely surrounds independent municipalities of 45,000, immediately adjoins other Ohio communities of 50,000, and the central business district is separated from Kentucky's second largest population center—some 165,000 persons—by only the Ohio River. The corporate area is about 80 square miles.

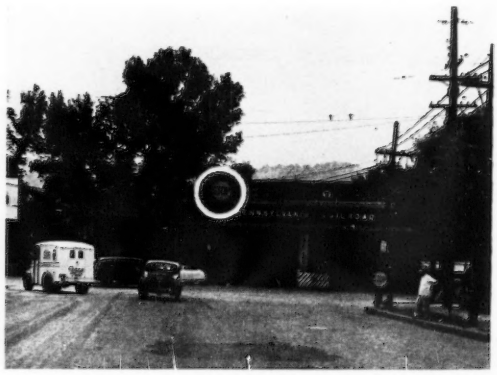
The widest streets in the city are 70′, and there are only three miles of this. Only a few other segments exceed 40′, the prevailing width of the through street system. Many are only 30′; some 24′; and one cross-town thoroughfare, carrying 15,300 vehicles per day, is 20′ wide. It has no alternate with which it could be paired for one-way operation.

While metropolitan Cincinnati's through street system has no semblance of regularity or order, the downtown street pattern is mainly a rigid 90° grid of 400′x400′ blocks served by 40′ streets. While most of the outlying traffic arteries change direction three to five times per mile, the downtown streets have almost perfect regularity.

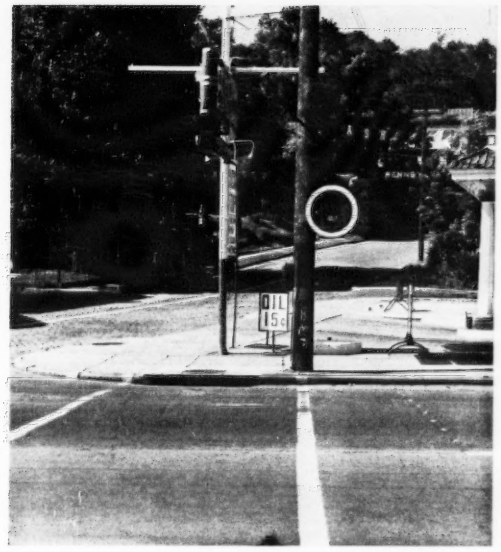
Early Traffic Administration

Traffic control grew "like Topsy" on this assorted pattern of thoroughfares in the period of greatest expansion of vehicular use, 1920-1940. Traffic engineering functions were assigned to existing city developments as the need for these services grew. As a result, various parts of the traffic engineering function are being performed even today by at least eight different units of city government. While this results in a tremendous amount of paper work and the need for many conferences between different departments concerned with the same problem, it is doubtful if a single, unified setup which would deal with all phases of traffic engineering, will be established within the foreseeable future.

Earliest history of traffic control in Cincinnati goes back to 1823 when speed of horse drawn vehicles on viaducts was regulated. First parking regulations were put into effect in 1828. In 1912, first downtown regulations were issued. Traffic counts were first made in 1913, and it was found that horse-drawn vehicles outnumbered automobiles. Official traffic signs and markings appeared in 1923; an accident record system was set up in 1926; the accident investigation squad was organized in 1936. Motor vehicle inspection was adopted in 1938; parking meters installed in 1941. The first traffic signals were installed in 1925, and the first at-



Overhead "Stop" signs are used to supplement side mounted signs at critical intersections.



Pedestrian "Walk" and "Wait" signals are used to improve safety at pedestrian crossing points.

tempt at synchronization was made in 1929. Cincinnati in 1923 had the nation's worst traffic accident rate and never during the intervening period has the city been able to become one of the leaders in traffic safety. Currently it has one of the poorest traffic fatality rates among all major cities. Hence a detailed discussion of early traffic control activities in Cincinnati may serve to some extent as an object lesson.

Early efforts at installing traffic control devices were done co-operatively by the police and automobile club. From 1925 to 1927 a civilian traffic commission assumed this function. From 1927 to 1930 the police again took the responsibility for installations. From 1930 to 1943 the work was handled by the Department of Public Utilities. In 1939, the Division of Traffic Engineering and Research was established in the Department of Public Utilities, and in 1943 this Division was transferred to the Safety Department, where it now remains.

The Safety Department employed a safety engineer in 1933, who in 1937 was transferred to the Public Utilities Department. In 1939 a traffic engineer was employed, but he was lost to war service in 1941 and the Division operated on a curtailed basis until the opening of the year 1949.

Resulting Dispersion of Functions

Unfortunately most of the responsibility for traffic signals remained with the Public Utilities Department when the Traffic Engineering Division was transferred to Safety in 1943. This has led to serious complications in the recent effort to modernize Cincinatti's substandard traffic signal system.

Cincinnati's Planning Commission developed the nation's first Master Plan in 1925, and this was completely brought up to date in 1946. Seven traffic surveys have been made periodically in this area from 1934 to date. Such work from 1949 to date has been placed on a specific project basis as a continuing part of the Division's program, rather than as a series of general surveys.

The signs and markings service is performed in still a third department, by the Division of Highway Maintenance, a unit of the Department of Public Works.

Designation of bus zones and routes, now generally considered a traffic engineering function because it deals primarily with traffic flow, remains vested in the Public Utilities Department. The Parks Department retains much of the authority over traffic control on the Parkways system. Geometric design remains primarily with the structural and highways units of the City Engineer's Office. Long-range planning until 1949 had been carried on almost exclusively by the City Planning staff. Recently, however, there has been a marked tendency on the part of all of these various divisions of city government to depend upon the Traffic Engineering staff for basic data and other services which are fundamentally within the scope of traffic engineering.

Present Traffic Engineering Organization

The present Division of Traffic Engineering and Research consists of a city traffic engineer, four assistant engineers, and staff. In the Safety Department, it operates as a major division, on a par with Police, Fire, and similar units. The assignments of the four assistants are: traffic studies and research; traffic signals and allied problems; curb and off-street parking; signs, markings, channelization and design. The assistant in charge of traffic studies and research also acts as principal assistant.

Aiding this professional staff are four junior traffic engineers, two draftsmen, five senior engineer aides, several junior aides, two senior stenographers and an account clerk. The parking meter shop with a foreman, and repairmen, also is a unit of the division. Through summer months, college students are employed on special projects.

For junior engineering aides, the Division draws upon the "co-operative student" system of city owned and operated University of Cincinnati. These students learn while they earn, alternately being employed and returned to school periodically to complete a normal four-year full-time course in six years. This system affords excellent aides to industry or governmental divisions, and at the same time provides students with funds and practical experience.

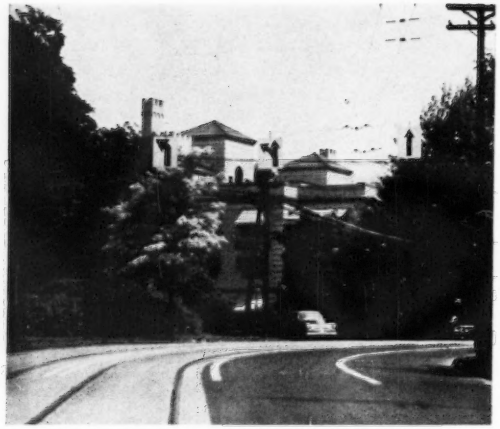
Traffic Control Devices

In the field of signs and markings, this Division investigates all complaints, requests and suggestions; reaches a conclusion and draws up the work orders for installation. These are forwarded daily to the Division of Highway Maintenance for installation pursuant to directions provided on the work orders. Thereafter the device is maintained by that Division, until revised or removed on order of the Division of Traffic Engineering.

Cincinnati's narrow streets minimize the amount of channelization that can be used. However, the irregular street pattern results in many odd-shaped intersections and this creates a need for minor channelization at numerous locations.

Channelization is handled in a manner similar to the signs and markings procedure, with these exceptions: A greater accuracy and detail is provided in the scale drawings for such projects; and approval of the City Engineer is secured before permanent islands are installed.

Funds for signs, markings and channelization are in the budget of the Division of Highway Maintenance. For the



Example of overhead lane marking signs.

current year this consists of $130,000 of gasoline tax money for traffic control, and $60,000 of parking meter revenues for parking control, in addition to funds expended directly for parking meter post and stall installation and maintenance.

The procedure in traffic signal work is much more involved. After determining needs and warrants by standard procedure, the Division of Traffic Engineering secures approval of the City Manager for expenditure of bond money for a stated project. The Department of Public Utilities then is furnished with scale drawings, in detail, of the proposed installation, together with color sequence chart, offsets, and full instructions as to how the installation is to operate. The Public Utilities Department proceeds with the drawing of specifications and letting of contracts. Since the city department stocks only a few maintenance items and the individual contractor purchases special materials only after signing of contract, long delays generally ensue before completion of such projects.

Since the signal maintenance shop carries on no regular program of signal inspection, and since these devices seem to have a habit of doing the unexpected, many Cincinnati traffic signals remain out of timing for long periods. This Division is now in process of setting up a signal inspection service as a step toward correcting that situation. This is but one of the many small problems one encounters in taking on the job of rehabilitating a badly run down traffic control system.

Geometric Design

Until very recent years, design of new street facilities rested entirely with other divisions of city government and the traffic engineer was simply given the job of operating the facility—whether good or bad from the viewpoint of traffic operation. Now, however, all important projects are so processed that the city traffic engineer has ample opportunity to review, and if need be to revise, the geometric design, before final structural detail is undertaken.

Deficient Motor Vehicle Laws

Omissions and idiosyncrasies in Ohio state motor vehicle laws help to complicate the life of a traffic engineer working under those laws. For example, the Ohio law governing right of way on through streets and upon making left turns does not comply with the national uniform act regulating traffic on streets and highways. As a result, standard warrants for stop sign and signal installation are not entirely applicable.

Furthermore, Ohio is one of the few states which has no accident reporting law; consequently the traffic engineer operates without comprehensive and specific information concerning accident causes. The recent Legislature passed an accident reporting law which is to become effective in 1953. Cincinnati partially overcomes this deficiency with a police accident investigation system which provides coverage on an estimated 50% of the traffic accidents within the city. The Division of Traffic Engineering files these accident reports in a five-year location file and thus is able to maintain basic statistics, spot maps, collision diagrams and to make detailed studies from the police accident investigator's findings.

Traffic Engineering Budget

The Division's current general fund budget amounts to $70,000, and covers general administrative expenses only. Included are payroll, office, drafting, and travel expense, operation of motor vehicles, and purchase of equipment.

Division of Highway Maintenance is scheduled to expend $190,000 on traffic control work in the current year; parking meter expenditures will amount to $200,000 for installation of new meters and $40,000 for maintenance and other parking control activities; and an estimated $200,000 will be expended this year in the first unit of a $900,000 program to rehabilitate the traffic signal system. Thus a total of approximately $700,000 is scheduled for expenditure this year on traffic control activities.

Appraisal of Traffic Needs

After many years of operating as a "complaint bureau" due to limited manpower, it was necessary in 1949, when expansion of the Division was undertaken, to take inventory and determine immediate and long-range needs.

(1) A quick look revealed that on a through street system requiring 3000 stop signs, 500 signs were entirely missing and 2000 more were substandard. Most of the latter were the old 18″ variety. The majority of other traffic warning and regulatory signs were comparable, but parking signs were nearly 100% standard.

(2) While a good many miles of painted line were being maintained, the street marking system lacked continuity.

(3) Basic traffic engineering data were deficient; there was no series of comparable data to indicate trends.

(4) While the city owned 2100 parking meters, only 1200 were in usable condition and most of these were not giving efficient service.

(5) Numerous deficiencies in the traffic signal system were readily apparent to anyone accustomed to traffic signals conforming with national standards. Signals at many locations were contributing to, rather than alleviating, problems of congestion and hazard.

The appraisal indicated that Cincinnati was at least ten years behind in its traffic control program. It was evident, therefore, that an organization, budget and program must be developed to do the equivalent of twenty years of traffic engineering work in the next ten years.

The traffic engineering personnel which has been assembled since completion of the city-wide inventory is intended to do that job. A modest increase in budgeted funds has been secured for signs and markings so that a few

years of increased activity in the replacement and extension of these devices will bring the city up to good standards. A $900,000 bond issue was passed at the November, 1950, elections to provide a substantial start toward rehabilitating the traffic signal system. At the same time $16,000,000 in expressway bonds and $2,000,000 in general street improvement bonds were passed. Some of the improvements made possible thereby are already under way; others are moving slowly due to national curtailments on materials.

Traffic Signal Improvements

Most important element in the traffic signal program will be complete rebuilding of the downtown signal system. Present signals are timed on a single alternate plan on a 40 second cycle which theoretically provides 15 mph speed. However, capacity is low, pedestrian control is ineffectual, and signal visibility is poor. The system was installed with an absolute minimum of cable so that simultaneous ambers are necessary. This has resulted in many accidents, including pedestrian fatalities. Also a non-standard system of flashing these amber signals was devised, some years ago, when emergency vehicles are operating in the area, and this adds to the confusion and hazard.

First step in modernizing downtown control is to be conversion to a complete one-way grid. This is particularly applicable to downtown Cincinnati due to heavy traffic volumes, narrow streets, narrow sidewalks, and the regular block pattern. The one-way grid was made possible this year with final abandonment, last May, of street cars.

Dual overhead far-side vehicular signals, low mounted pedestrian signals directly ahead in the pedestrian crosswalks, and extensive use of mid-block pedestrian signals, will be features of the new system.

The normal timing plan will consist of quarter-cycle offsets; and flexibility as to both speed and capacity is to be attained, in tentative plans, by centralized control over the length of cycle.

Most downtown intersections will have equal cycle splits, as there are equally heavy East-West and North-South movements. Multiple dials may, however, be warranted at a few points where heavy peak-hour directional flows exist.

At several complex intersections on the fringe of the downtown area, full actuated control is being considered.

Lane markings help traffic flow at overloaded intersections.

Overhead signals and painted lines channelize and designate left turn lanes to expedite traffic.

Study is being given to a fire-lane system for the expediting of emergency vehicles through the one-way grid.

Outside the central district the improvements in traffic signals will consist mainly of mounting signal heads for improved visibility, interconnecting signals on main thoroughfares and providing flexible control where needed; discontinuing a few unwarranted signals and changing many others to a semi-actuated basis; providing pedestrian control where warranted; and installing traffic density control at a number of overloaded intersections.

Other Improvements in Regulations and Controls

Most traffic signals in Cincinnati flash as 4-way ambers in late evening hours, even though located on main thoroughfares. This has resulted in many serious collisions. Cincinnati motorists have been introduced to the flashing red light in the past two years but as yet probably 50% of them don't realize that it means Stop—though that requirement has been in state law and city ordinance for many years. In all new or revised installations, the use of flashing red is given proper study and installed where warranted, for after-hour operation. Also at many problem stop locations, the stop sign is being supplemented by flashing red. Thus the Cincinnati motorist is almost certain to learn and respect the standard flashing red as does his fellow motorist elsewhere.

Pedestrian actuated signals are being provided at a number of school crossings—probably at 100 locations in the current program. Standard walk-wait signals, using the amber-colored wait lens, are used for pedestrian indication and have been well accepted. A sequence of flashing amber to solid amber to red was first used for vehicular indication, but the standard green-amber-red has proved more under-

(Continued on page 372)

Underground Garage In Los Angeles

Adapted from Data Submitted by the Downtown Business Men's Association

Los Angeles, California

History of Garage Location

THE property known as Pershing Square with its surrounding street areas belongs to the City of Los Angeles and with the exception of the California Indians and the King of Spain has never belonged to anyone else.

Legends with reference to this property tell us that because it was somewhat swampy in nature in the early days and with a considerable natural growth of trees and grass, it was used regularly as a camping spot for travelling groups going through from San Diego to San Francisco, or return, and between closer points surrounding the Los Angeles Pueblo. It was this general condition undoubtedly which caused the government of the Pueblo to refrain from selling this particular block of the Pueblo lands and made it possible to keep it in the possession of the present government as a "public place."

It should be noted that this is not a park in the technical sense and has never been dedicated for park purposes. On the contrary, its dedication has been for the enjoyment of the citizens of the city, much like the old "Commons" of Massachusetts and other states.

While most attorneys agreed that the city, through the Park Department, probably had full authority to lease the underground rights in the park for garage purposes, it was felt that financing concerns would not be willing to loan large sums of money on the garage without more specific authority being given by the people of the city. Consequently, a Charter Amendment was offered to the voters in the April election of 1947 which covered the situation satisfactorily.

This Amendment was carried by a two to one vote and all publicity with reference to the election carried the inference or direct statement that it was the intention to lease Pershing Square for a garage if the Amendment carried.

Repeated efforts were made in early days to bring about the construction of a garage under Pershing Square. The earliest we have record of was 1928 when a group of local property owners and business men attempted to promote it.

In 1931 and 1932 three different groups of people worked on plans for such a garage, all of which the Downtown Business Men's Association has examined. None of these proposals, however, seemed to get to the core of the matter which was working out a definite plan under which the city would either build and operate such a garage itself or would lease the property to private parties for such construction and operation.

The Association started the activities which culminated in the present lease in the early months of 1945.

Parking and Economic Studies

The location was established in the survey and report known as "Downtown Los Angeles Parking Study," which the Downtown Business Men's Association prepared, by showing that Pershing Square was in exactly the right location to serve a great number of people and institutions with convenient parking who were not served at that time, or now, by reason generally of the encroachment of Bunker Hill into the more level area of the Downtown District.

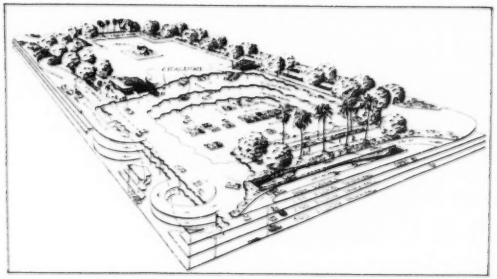


Photo by Rothschild

Schematic layout of underground garage.

This study was followed by an intensive investigation to determine both the economic and engineering facts concerning this and other possible parking projects. A complete proposal was written showing the desirability of the project, giving a close estimate of its cost, and an estimate of its economic feasibility.

All of these studies have been kept up-to-date through the assistance particularly of Ralph Dorsey (Mem. ITE) Street Traffic Engineer of Los Angeles, and many other city, county and state engineers.

During the second half of 1946 the Downtown Parking Association, which had been organized by the Downtown Business Men's Association to carry on parking activities, determined that the Pershing Square project was the most important and most feasible of all parking projects studied, and gave the staff of the two organizations full authority to proceed toward carrying out the proposal.

Development of Construction Plan

The 1947 Charter Amendment was the first concrete step taken, followed by approximately a year of study and preparation of a lease form which would be satisfactory to the city and upon which persons interested in building and operating the garage might reasonably be expected to bid.

During the same period, many weeks were spent on tentative plans for the new park surface culminating in the adoption of the Official Plan by the Park Commission during 1949. These plans were submitted to the general public by advertisement and requests made for proposed changes which prospective bidders thought might be better than the Official Plans.

This request resulted in a number of proposed changes which were studied by the Park Commission intensively over a period of three months. The principal request for a change in plans was one asking that the successful lessee be permitted to materially raise the surface above its present ele-

vation. Some plans called for as much as an eleven foot raise along the Hill Street side to make it possible for cars to drive directly off the street into the garage rather than to go underneath the present park level.

This request was finally denied by the Commission and the original plans, with minor modifications and some additional alternatives, were re-adopted and presented to the City Council for approval.

In October 1949 bids were first called for on the lease and surface plans, and a period of about 60 days was given prospective bidders in which to file bids and post a $50,000 cashiers check to guarantee carrying out the project if their bid was accepted. At the end of this period no bids had been received and an extension was given at the request of several persons who had indicated a desire to bid. No bids were received at the end of the extended period and for a time it appeared that the Department of Recreation and Parks would drop the whole matter on the ground there was not sufficient interest to warrant re-advertising the project.

However, at the Downtown Business Men's Association urgent request and written statements from several concerns, that they would bid if given another opportunity, bids were again called for, but again none were received due to prospective bidders having considerable difficulty making final arrangements for financing. However, after a further extension of about six weeks was made, a single bid was received.

Plans for the garage structure have been drawn by the Stiles Clements Associated Architects and Engineers. The ground was broken for the Pershing Square Underground Garage on February 1, 1951. It is anticipated that the garage will be completed by June 1952.

Financing The Project

After long negotiations concerning possible income to the city and the probable tax rate on the leasehold, a guarantee to the city was made by a group of parking operators, who will become the operators of the Pershing Square Garage, providing that the city will receive in the aggregate at least $12,000 per year for the first twenty years of the lease period as rental plus the taxes which the city will receive where none have been received before.

It is estimated that the taxes will bring in at least $25,000 per year to the city, plus nearly $75,000 divided between the County and the School District. After the twenty-year period it is believed the profits of the garage, in which the city will share, will bring in a much larger sum than the $12,000 yearly guarantee.

Estimated cost of the garage structure including the new park is $5,000,000. This amount is all private capital, no portion being provided by the city or any other governmental agency.

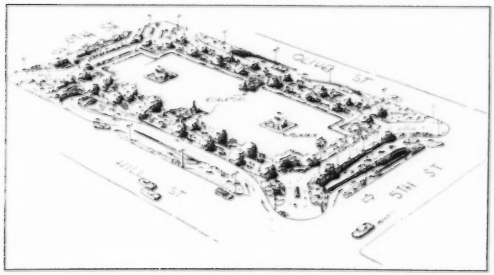
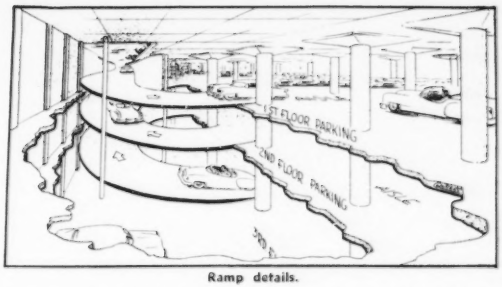


Photo by Rothschild

Pershing Square, Los Angeles, California.



Ramp details.

Financing was accomplished by a first mortgage loan from The Equitable Life Assurance Society, a second debenture mortgage bond sale to local business interests and the purchase of common stock by the syndicate, City Park Garage, Inc. A total of $250,000 of second debenture bonds were purchased by downtown business and property owners through the activities of the Downtown Business Men's Association, who obtained the agreement to purchase these in a whirlwind ten-day campaign.

The lease is for 50 years, at the end of which time the structure must be returned to the city park department who, thereafter, will be able to operate it or lease it for operation on behalf of the city.

Traffic Design

The garage structure consists of three stories, all underground. The approximate depth of the structure between the third floor and roof is 29 feet. Each floor represents 210,000 square feet of floor area or a total of 630,000 square feet. The maximum capacity of the garage is approximately 2,000 parked cars.

Interior ramps are circular in design and permit driving automobiles from any incoming ramp down to all floors of the garage. All exterior ramps leading into the garage are nearly one block in length and will provide an enormous storage capacity for automobiles waiting to go into the garage, thus taking them off the streets. All automobile ramps in and out of the garage will pass under the sidewalks, avoiding any possibility of conflict between pedestrians and automobiles.

The park location is the ideal spot for a large garage. It is surrounded by four excellent thoroughfares of which Fifth and Sixth are one-way, facilitating traffic to and from the west particularly; while Hill and Olive give excellent access from the north and south. All four streets connect directly, or nearly so, to important freeways now being constructed on the north and west sides of the downtown district. Additional freeways to be constructed eventually on the east and south sides of the district will, undoubtedly, provide similar connections for the four streets mentioned.

All car movements in and out of the garage are parallel to the curbs and must move in line with existing street traffic. This provides for moving the greatest amount of traffic in and out of the garage with the least possible interference with other traffic.

(Continued on page 376)

A Nomograph For Urban Traffic Signal Priorities

Modified Detroit System

By F. Houston Wynn (Assoc. Mem., ITE)
Research Assistant, Yale Bureau of Highway Traffic, New Haven, Connecticut

A RECENT inquiry into the methods used by urban traffic engineers to determine an order of priority for new traffic signals revealed a wide interest in the subject but an almost universal lack of adequate priority-rating methods. A number of schemes were submitted as examples of priority systems now in use, practically all of them based on the proposed minimum warrants for fixed-time traffic signals which are described in the *Manual on Uniform Traffic Control Devices*.[1] Most of these formulae attempt to rate the warrants on a percentage-of-fulfillment basis, but this is not a reliable index since need for signals is not directly proportional to fulfillment. (Note that Section 213, 1948 Edition of the *Manual*, requires that two or more warranting conditions must each be at least 80 per cent satisfied before the combination will constitute a condition warranting signal installation.)

The "Detroit System"

The only priority formula that appears to have gained more than local acceptance, and the one which most nearly achieves a satisfactory method of evaluating the usual conditions that contribute to signal need, is the so-called "Detriot System" which originated in the Traffic Engineering Bureau of the City of Detroit, Michigan, in 1939. The several traffic engineers who now employ this system have made but few modifications to it, and, in general, find that it satisfies the purpose intended. Among larger cities using the formula are Detroit, San Francisco, and New York.

An outline of the Detroit Formula is shown in Table I. As mentioned above, this priority system was developed in 1939 and the series of considerations evaluated by use of the formula were largely the conditions described in the 1935 edition of the *Manual on Uniform Traffic Control Devices* as warrants for fixed-time traffic signals. However, a considerably modified interpretation of the warrants was used in compiling the formula. Such modifications and additions were purely matters of judgment and expediency on the part of the designers of the formula and have, for the most part, been accepted by subsequent users as improvements over both the 1935 and 1948 warrants.

The formula differs very radically from the warrants in that at each location studied it evaluates conditions of greater or lesser magnitude than the minimum warrant. All of the several conditions are thus weighted and the weights totaled, the result being an over-all evaluation of the location which can be compared with similar evaluations for other locations.

Some of the measures incorporated in the formula are not weighted in the same proportions as are the warrants.

Table I

METHOD OF DETERMINING TRAFFIC SIGNAL WARRANTS
City of Detroit—Traffic Engineering Bureau

1. Traffic Volume (24 hour)

A = Main street veh. vol. (thousands) = ___
B = Cross street veh. vol. (thousands) = ___
K = (ratio) = $\left(\frac{A}{B} < 4, K = 2.0\right)$

$\left(\frac{A}{B}\right.$ 4 to 8, K = 1.5)

$\left(\frac{A}{B}\right.$ > 8, K = 1.0) =

A × B × K = ___ × ___ × ___ = (volume rating) ___

2. Left-turn (24 hr. vol.)

A = Main Street "through" veh. (thousands) ___
B = Left turns from Main Street (thousands) ___
K = (same as above)
A × B × K = ___ × ___ × ___ = (left-turn rating) ___

3. Accidents (12 months)

A history of 10 reported accidents (fatal, injury, property damage) in a twelve-month period **of the type correctible by signals** is given a value of 100.
No. of acc. ___ × 10 = (accident rating) ___

4. Pedestrians (24 hours)

	Crossing against	10,000 veh.;	5,000 veh.
Heavy (3000 peds./24 hours)		100	50
		75	20

(pedestrian rating) ___

5. Through Traffic

Distance Between Exist. Signals	Main Street 24-hr. veh. vol. 15,000 veh.	8000 veh.
4000 feet	100	30
3000 feet	50	15

(thru street rating) ___

6. Coordination of Signals

Existing signals two cycles apart = + 50
Existing signals one cycle apart = + 20
New sig. ½ off ½ cycle dist. = — 20
New sig. ½ off ½ cycle dist. = — 50
(Coordination rating) ___

7. One-Way Streets

Both streets one-way, no signals = — 20
Both streets one-way, signal within 500' = — 50
Both streets one-way, signal within 1500' = — 20
(One-way street rating) ___

8. Aproach Speed

Average Approach Speed (MPH)	=	25	35	45	50
Rating	=	0	20	50	75

(Speed rating) ___

9. 4-Way Stop Signs

A = Main Street Vol. (24 hrs.) = ___
B = Cross Street Vol. (24 hrs.) = ___
K = Ration $\frac{A}{B}$ (max. value = 3) = ___

A + B + (A+B) 2K = ___ + ___ + (___ + ___) 2 ___ =
(4-way stop rating) ___

10. Unusual Conditions

Unusual conditions not to total more than 50 points, plus or minus. Examples of unusual conditions:
Church = +5
School = +20
Offset Intersection = —10 to —50
(Unusual conditions rating) ___
Total Rating ___

Note:
A rating of about 300 points is usually considered to **warrant** a traffic signal. Initial ratings of 200 to 300 points probably warrant more thorough investigation. For **priority** purposes, rank investigated locations by descending order of ratings.

[1] *Manual on Uniform Traffic Control Devices*, Public Roads Administration, Washington, D. C., Nov. 1935 (Revised ed., August 1948.)

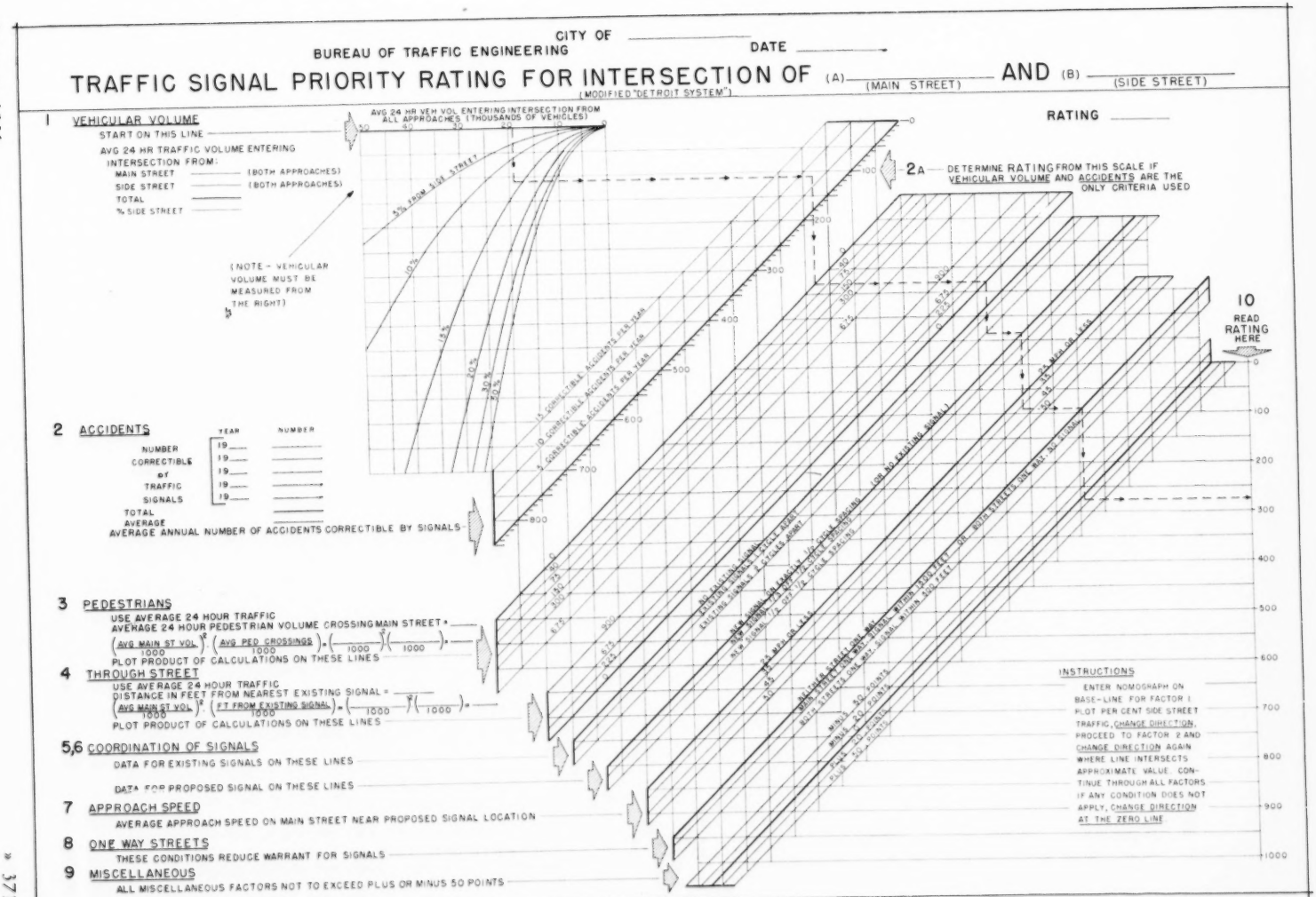
CITY OF _____

BUREAU OF TRAFFIC ENGINEERING

DATE _____

TRAFFIC SIGNAL PRIORITY RATING FOR INTERSECTION OF (A) _____ (MAIN STREET) AND (B) _____ (SIDE STREET)

(MODIFIED "DETROIT SYSTEM")


RATING
1 VEHICULAR VOLUME
START ON THIS LINE
AVG 24 HR TRAFFIC VOLUME ENTERING INTERSECTION FROM:
MAIN STREET (BOTH APPROACHES)
SIDE STREET (BOTH APPROACHES)
TOTAL
% SIDE STREET
(NOTE - VEHICULAR VOLUME MUST BE MEASURED FROM THE RIGHT)
AVG 24 HR VEH VOL ENTERING INTERSECTION FROM ALL APPROACHES (THOUSANDS OF VEHICLES)
5% FROM SIDE STREET
10%
15%
20%
30%
40%
2A DETERMINE RATING FROM THIS SCALE IF VEHICULAR VOLUME AND ACCIDENTS ARE THE ONLY CRITERIA USED
10 READ RATING HERE
2 ACCIDENTS
YEAR
NUMBER
NUMBER CORRECTIBLE BY TRAFFIC SIGNALS
19__
TOTAL
AVERAGE
AVERAGE ANNUAL NUMBER OF ACCIDENTS CORRECTIBLE BY SIGNALS
10 CORRECTIBLE ACCIDENTS PER YEAR
8 CORRECTIBLE ACCIDENTS PER YEAR
6 CORRECTIBLE ACCIDENTS PER YEAR
4 CORRECTIBLE ACCIDENTS PER YEAR
3 PEDESTRIANS
USE AVERAGE 24 HOUR TRAFFIC
AVERAGE 24 HOUR PEDESTRIAN VOLUME CROSSING MAIN STREET =
PLOT PRODUCT OF CALCULATIONS ON THESE LINES
4 THROUGH STREET
USE AVERAGE 24 HOUR TRAFFIC
DISTANCE IN FEET FROM NEAREST EXISTING SIGNAL =
PLOT PRODUCT OF CALCULATIONS ON THESE LINES
5,6 COORDINATION OF SIGNALS
DATA FOR EXISTING SIGNALS ON THESE LINES
DATA FOR PROPOSED SIGNAL ON THESE LINES
7 APPROACH SPEED
AVERAGE APPROACH SPEED ON MAIN STREET NEAR PROPOSED SIGNAL LOCATION
8 ONE WAY STREETS
THESE CONDITIONS REDUCE WARRANT FOR SIGNALS
9 MISCELLANEOUS
ALL MISCELLANEOUS FACTORS NOT TO EXCEED PLUS OR MINUS 50 POINTS
INSTRUCTIONS
ENTER NOMOGRAPH ON BASE-LINE FOR FACTOR 1
PLOT PER CENT SIDE STREET TRAFFIC, CHANGE DIRECTION, PROCEED TO FACTOR 2 AND CHANGE DIRECTION AGAIN WHERE LINE INTERSECTS APPROXIMATE VALUE. CONTINUE THROUGH ALL FACTORS IF ANY CONDITION DOES NOT APPLY, CHANGE DIRECTION AT THE ZERO LINE

Thus, accidents lose some of their importance as warrants for signals. On the other hand, coordinated movement of vehicles on arterial streets is weighted very heavily, the through traffic warrant, coordinated movement warrant, one-way street warrant, and speed warrant each directly or indirectly affecting system coordination. This treatment of accidents and system coordination is in accord with the thinking of many traffic engineers.

The four-way stop warrant included in the formula was intended to alleviate a condition peculiar to Detroit at the time the formula originated. While the warrant was effective in speeding the removal of 4-way stops, little use would be made of it in most cities.

Nomograph Developed

The Detroit Formula is easy to apply to any location for which the various data are available. It may be noticed, though, that calculation of weights for the volume warrant involves a decrease in the size of a "k" factor as the proportion of cross traffic to main street traffic becomes smaller. In the formula the value of "k" decreases by "steps," the value changing from 2.0 to 1.5 to 1.0. For example, if A/B = 3.9 (side street traffic approximately 21%), k = 2.0; if A/B = 4.1 (side street traffic approximately 19%), k = 1.5. This results in a certain inequity of treatment. Speculating on means of adjusting for this discrepancy, a nomograph was developed to accomplish volume weighting. Some of the other conditions weighted by the formula also involves interpolation of values—the pedestrian warrant, the through traffic warrant, and the speed warrant—and since such interpolation may be accomplished visually by estimating between lines properly spaced on a chart, the accompanying nomograph was then devised to accommodate the whole formula.

The nomograph here developed modifies the Detroit Formula in two aspects. As noted above, the formula was based on warrants contained in the 1935 edition of the *Manual*. The 1948 edition omits the left-turn warrant and compensates by liberalizing the volume warrant. Factors of "k" which apply to the new warrant are just double those used with the old one. The new volume warrant has been used in the nomograph and the left-turn warrant omitted, resulting in somewhat easier calculations. The other major modification consists of elimination of the four-way stop warrant.

Incorporated in the nomograph are two rating scales, one accumulating the rating for all warrants, the other merely summarizing the volume and accident warrants. Traffic volume and accident hazard are the usual considerations at a good many intersections, and where no other conditions are involved this intermediate scale may be used.

We would suggest that anyone interested in using the nomograph for priority rating would do well to prepare a tracing or plate of it. It may then be reproduced in quantity so that data for each intersection investigated for signal priority can be plotted on a separate sheet and kept on file.

(Continued from page 367)

standable. This requires use of vehicular actuation at intersectional school crossings, hence mid-black crossings are sought where practical.

Extensive use is being made of internally illuminated traffic control signs at critical points. These have proved highly satisfactory and greatly reduce confusion where motorists have tended to have some hesitation over deciding the proper course of action.

Consideration is being given to the establishment of reversible center lanes on several thoroughfares which carry predominantly directional flow in peak hours. This is being favored over one-way thoroughfares because few parallel facilities are available.

Expressway System

Cincinnati's expressway program consists mainly of the Mill Creek expressway to the north, the Northeast expressway, the Third Street Distributor bordering the central business district on the south thereof, between the Ohio River and the central area, and an extensive series of laterals and modified expressways forming both a network over the area and a series of circumferential routes outside the congested area. All then connect with the prospective new Dixie highway through Kentucky.

The first unit of the Mill Creek expressway is in use; the second unit is on the drafting boards and is financed. The right-of-way for the Third Street Distributor is awaiting state and federal programming.

Parking

In another phase—the parking problem—a revenue bond program of $2,000,000 as the initial phase of a prospective $20,000,000 program is now before City Council. Sites have been selected for lots to accommodate 650 car spaces and these later may be multiplied by structures. All is in conformity with the Master Plan which calls for 6,000 new spaces in a ring contiguous to downtown stores and business blocks.

Cincinnati is Making Progress

Cincinnati, a leader in city planning but for years one of the nation's most backward major cities in providing efficient traffic control and improved traffic facilities, now is moving rapidly toward catching up with her contemporaries in this important phase of community economy.

Traffic and parking are live subjects in Cincinnati today and are going beyond the planning stage, into an action program.

Area Improvement Program In Philadelphia

The City Planning Commission recently announced a long-range improvement program for the redevelopment of the University Area in West Philadelphia, to wipe out "extremely blighted" sections and erect in their stead multi-story garden apartments, modern shopping centers, wider streets, and boulevards.

The plan, proposed as a guide for the City, the Redevelopment Authority, and business interests in restoring this area, will also provide a more appropriate setting for two of Philadelphia's leading educational institutions. This area was certified for redevelopment in 1948. Details of the plan are outlined in a report which has been published by the Commission.

Public Support And Traffic Engineering

By Maxwell Halsey (Mem., ITE)
Executive Secretary, Michigan State Safety Commission, Lansing, Michigan

THE traffic engineer today is not receiving nearly as much benefit from so-called "public support-public education" programs as are his colleagues in the traffic accident prevention team, such as, the police chief, the judge, or the school superintendent.

The simple test of this is to merely tabulate the number of column inches of newspaper space, radio programs, radio platters, motion picture trailers, posters, leaflets and stickers which tie in the police, the judge, the school superintendent or the traffic engineer.

This situation is serious if it is assumed that, generally speaking, the governmental agencies that the people know the most about are likely to advance more rapidly than agencies which the people hear less about and thus know less about.

Accidents vs. Congestion

The history of traffic engineering has been full of debate about the functions and scope of traffic engineering. These healthy growing pains of a new profession have led the traffic engineer up from the narrow confines of a sign-signal-marking mechanic to the broader fields of design, planning, illumination, terminal arrangements and a lot more items making up the total field of "transportation."

In view of this, the author is anxious that the reader not take the use of signs, signals and markings as accident prevention devices capable of building good public support as any attempt to narrow the field of traffic engineering.

The Need For Public Support of Traffic Engineering

If the techniques of traffic engineering, which can be so effective in reducing accidents and congestion, are to make their maximum contribution they must be understood by the "man-on-the-street" because this same individual is the motorist, the pedestrian, the taxpayer and the voter (who elects the legislators, governors, mayors and aldermen who have the most to do with accepting traffic proposals and providing funds).

It would be unfortunate if the "man-on-the-street" were to be so "conditioned" by public education programs that he looks only to the police for protection against accidents—or only to the police, the courts, license authorities and the school people. If it never occurs to the "man-on-the-street" that the traffic engineer can help reduce accidents (as well as relieve congestion) then traffic engineering and the traffic engineer would be in an unfortunate position.

Thus, there is real need for public education programs to inform the public frequently on what the traffic engineer is doing.

The "public understanding" which can be created is badly needed to obtain support for numerous traffic engineering proposals such as survey recommendations, signs, signals, markings, one-way streets, prohibited parking, no left turns, etc.

If the public has not been thoroughly sold through a public education program then it is much more difficult to obtain adequate funds for the operating budget, adequate salaries, equipment, etc. And if a high degree of public support is not available then it is not as easy to raise the level of the department on government organization charts and the traffic engineer is less likely to be given "status" on planning boards and parking authorities.

It is easy to point out that some safety programs are of the lowest order of press-agentry, but it would be dangerous to let this act as a "red herring" and draw the traffic engineers off the main trail which is—how do we get more public support for traffic engineering.

Development of State-Wide and Nation-Wide Public Education Programs

Prior to 1944 there were no coordinated safety educational programs at the state or national level. The author was privileged to develop the first state coordinated program in 1944. It was called the Michigan Brake-Check program. It was designed to provide an overall public education structure within which every county, every city and every organization interested in safety could participate. It is conservatively estimated that this at least doubled the amount of public education compared to the previous condition where no coordination existed and where there was no master plan, blue print or structure for operations in the public support field.

This first program was aimed at having public education coordinated in support of a traffic law enforcement activity for several reasons. The accident curve was rising rapidly and the "E" of enforcement was considered more rapid in its results than the "E" of education or the "E" of engineering. There was a police chief in almost every community but traffic engineers or local safety councils in but a few communities. Thus a program aimed at police participation would reach a maximum number of communities.

In the meanwhile Michigan was starting to apply its pattern to other safety subjects by conducting emphasis programs on pedestrian safety, child safety, etc.

This was followed by the development on the West Coast of twelve monthly themes of safety which fitted the advertisers who frequently advertised one item for thirty days in national magazines, on billboards, over the radio, etc. This evolved into "operation safety" now conducted by the National Safety Council.

The pattern of these twelve monthly themes is distributed as follows:

Six Deal With Enforcement Subjects
(1) Vehicle Maintenance in May
(2) Speed in July
(3) Signs of Life in August
(4) Night Traffic Hazards in October
(5) Pedestrian Safety in November
(6) Holiday Hazards in December

Six Deal With Pure Educational Subjects
(1) Winter Hazards in January
(2) Know and Obey Traffic Laws in February

A typical roadside installation for the "Signs of Life" program in Michigan.

(3) Motor Manners in March
(4) Child Pedestrian and Bicycle Safety in April
(5) Vacation Driving in July
(6) Child Safety in September

ONLY ONE Deals With a Traffic Engineering Item

(1) "Signs of Life" in August

This can contain stop signs, traffic signals, "no-passing" zone lines and lane lines as highly specific items which permit a three-pronged attack of public education *plus* enforcement *plus* traffic engineering. Speed signs can be included but they do not give the traffic engineer as clean-cut a public support position as do the other items.

Michigan Pioneers a Traffic Engineering Tie-In With Operation

In 1950 the Michigan State Safety Commission undertook to bring the field of traffic engineering into a state-wide program of traffic accident prevention in conformity with the Operation Safety monthly theme for August of "Signs of Life." The following steps were taken:

(1) The Commission, which sponsors the Michigan emphasis programs, requested the Highway Department, as one of its member departments, to assume the leadership on the August "Signs of Life" program. The Highway Department agreed to take the major responsibility for the program and to undertake the following six specific items:

(a) Original preparation of six news releases and three sets of newspaper mats mailed one a week to local officials in all communities and counties to be filled in and released by them.

(b) Original preparation of four state-wide releases sent to all daily and weekly newspapers during August.

(c) Original preparation of sixteen radio spot announcements sent, four at a time, to each city having a radio station.

(d) Original preparation of four fifteen-minute radio platters sent to twenty-six radio stations.

(e) Erection of 150 street side poster boards located in transition areas throughout the state carrying the standard uniform two-color poster developed especially for this program. These carry a credit line at the bottom "Maintained by the Michigan State Highway Department."

(f) Print for the Michigan Association of Chiefs of Police a "Police Training Manual on the Apprehension of Stop Sign Violators."

(2) The Commission obtained the agreement of its 69-Member Advisory Committee to select "Signs of Life" as one of the six programs for the year which are picked from the twelve monthly themes of Operation Safety.

(3) The Commission narrowed down the broad theme of "Signs of Life" to a much more specific theme "Obey Stop Signs" which made it possible to bring into the program both the police and the engineers.

(4) The Commission arranged for the underwriting of 4,100 posters, 13,700 leaflets and 33,750 correspondence stickers which were used during the program.

The program was very well received. It generated 1,632 column inches of newspaper space in newspapers scattered throughout the state. The Highway Commissioner received many compliments on the safety poster boards. The Michigan Association of Chiefs of Police was grateful to the Highway Department for printing the police training manual and seventy-five police departments used about three thousand of them in training schools which they conducted.

Michigan's Plans for 1951

This year the Michigan group has selected "Traffic Signals" as the subject for emphasis. (Next year "no passing zone lines" may be selected, the following year "lane lines" may be selected and the subsequent year "speed signs on curves" may be selected. After these five "specifics" have been covered in five years it may be time to go back to "Stop Signs" and start the cycle all over again.)

The same general procedure will be used as last year with four additions. The police training manual on "The Apprehension of Traffic Signal Violators" to be printed by the Highway Department will include an additional twenty pages containing the newly developed standards for Traffic Signals. Attempts will be made to obtain underwriting for eighty prints of a motion picture trailer to reach several hundred theaters and five television stations. Attempts will be made to obtain underwriting for sixty additional radio platters containing forty spot announcements by prominent traffic engineers. The Highway Department will add fifty more street side safety boards to bring the total to two hundred. (The long range plan is to ultimately expand these boards to a total of five hundred thus covering all transition and school zones.)

Analysis of Program

From the Traffic Engineer's point of view this kind of a program has a lot of advantages.

It gives an engineering item far more publicity than it ever had.

It gives the public the feeling that the traffic engineer is an important part of the accident prevention team.

It gives the traffic engineer an "occasion" or "event" which

can be used to bring in the broader aspects of traffic engineering, traffic planning and highway engineering.

It gives the highway department an opportunity to further improve its public relations and routine cooperation relationship with local officials who become more aware of how much the highway department is actually doing to prevent accidents.

It adds to the prominence of the highway engineer and the local traffic engineer who are worked into the news releases and radio programs.

New Releases

It is logical to call upon the highway department for the actual work of preparing news releases to be filled in locally and taken to the newspaper locally. Most highway departments have a public relations department or at least one man skilled in this field.

Radio Programs

The same logic follows here. It is natural to use the actual voice of the Highway Commissioner and the State Traffic Engineer as long as the Highway Department is playing such an active part in the safety program.

In both the newspaper and radio fields it will be found that the name of the Highway Department, its Commissioner and its Traffic Engineer have a better chance of being used on an overall safety program than on a direct release by the Department on something the editor does not think will be of as great general interest to the readers or the audience.

Police Training Manuals

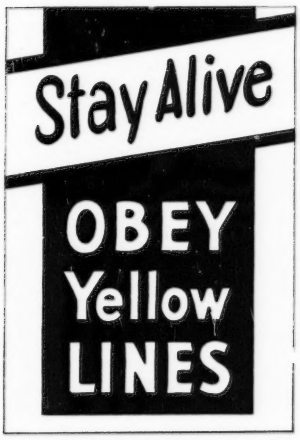
Unless the total plan has been considered it would seem strange to a traffic engineer for a state traffic engineering division to print a police training manual. Actually the traffic engineer works in a lot of fields where his interest is mutual with that of the police. The relationship goes something like this: In most local police departments it will be found that the enforcement of stop signs and traffic signals represent a proportionately high volume enforcement item. The traffic engineer wants these control devices obeyed or they are of no value or else actually increase accidents. They will not be obeyed if police enforcement does not take action against violators. The police want the devices obeyed to reduce accidents. The police sometimes claim that stop signs and signals need engineering improvement to make them easier to enforce. The traffic engineers sometimes claim that the police do not enforce control devices enough to make them effective. The relationship between the police and the traffic engineer can be further improved by working together on a joint project.

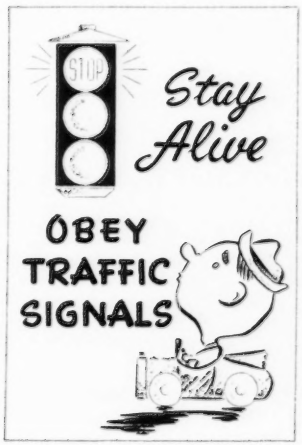
The Highway Department will always have a public relations and a political problem in the smaller communities where there is no traffic engineer to help sell good roadways with good controls. In many of these communities the police department has been forced to take on the function of traffic engineering. Thus if the local police chief obtains something which helps him and which was made possible by the highway department then he may become more responsive toward engineering matters.

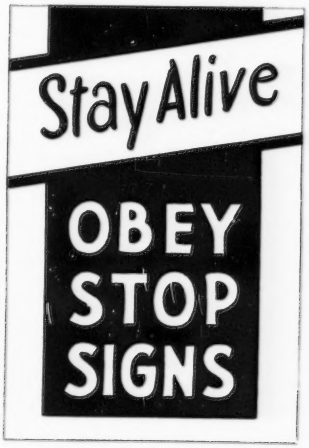
Street Side Safety Poster Boards

The trend in Michigan has been for more and more communities to erect safety poster boards on which to display safety posters. These have an obvious advantage over posters customarily displayed in store windows, public buildings and office and factory bulletin boards and that is that they get the safety message to the motorist at the time he is driving. Once the boards have been erected then a permanent display situation has been created in which standard uniform posters are erected on each of the state-wide emphasis programs conducted by the state.

The Michigan State Highway Department has adopted this technique for highway use. The safety poster boards are erected in transition areas and near schools located on highways because speeds are relatively lower and volumes relatively higher at such locations. The boards are designed







The above illustrations are typical posters used by Michigan during their "Signs of Life" program.

to carry a standard uniform poster 24x36 inches. They are mounted 4 feet high and 10 feet from the edge of the pavement with no curb and 2 feet with curb. They cost about $10.00 installed. The posters are made with reflecting paint by the Highway Department at an average cost of fifty cents each.

Suggested Action By Traffic Engineers

It is suggested that Traffic Engineers work closely with the national operators of "Operation Safety" to see if the traffic engineering approach on accident prevention can't be given a better break than the status of one-twelfth which it now has.

It is suggested that each state traffic engineer work closely with the State Safety Commission or State Safety Council to be sure that the state selects Signs of Life for one of its "Operation Safety" programs for the year.

It is suggested that each city traffic engineer work closely with the local safety council and do all the things at the city level that Michigan is doing at the state level. It would seem good public relations policy for the city traffic engineer to erect the safety street side boards as a direct contribution to the local safety program.

(Continued from page 369)

Local and national studies indicate the maximum number of cars leaving the garage at any time would be during the evening peak hour, from 4:45 to 5:45 P.M., when approximately 720 cars would leave. With the 2000-car capacity it is anticipated that from four to five thousand cars will be parked daily when the garage is in full operation.

Persons using the garage are provided with escalators, both up and down, from all floors to the park surface adjacent to the main sidewalk surrounding the park area. Ample rest rooms are provided in the garage and rest rooms segregated from the garage property will be provided with easy stair connections from the main sidewalks, for the general public, as a park convenience.

Services for automobiles will be provided consisting of gasoline, lubrication, tires and other accessories, and undoubtedly washing and other servicing found in first class garages will be available.

A beautiful new park surface design has been developed by the architects through consultation with prominent landscape architects and the staff of the Recreation and Parks Department so that the new park when finished will be far more beautiful than the existing one and probably more usable for the great majority of persons than the present design.

Construction Quantities

Approximately 200,000 cubic yards of material, which is equivalent to 270,000 tons, will be excavated. About 23,000 cubic yards, which is equivalent to 31,000 tons, of good soil will be brought back and placed on top of the garage roof to provide a satisfactory park surface. Approximately 50,000 cubic yards, or 105,000 tons, of reinforced concrete will be used.

With its 2000-car capacity, the Pershing Square Garage will be the largest underground garage in the world.

REFLECTS THE CRAFTSMAN'S SKILL

One of the Answers to Your Traffic Control Problems

the NEW IMPROVED

4000 HOUR MAGNOTRONIC TRAFFIC SIGNAL LAMP

- THE ULTIMATE IN QUALITY
- GUIDE TRAFFIC SAFELY
- DEPENDABLE TROUBLE-FREE SERVICE
- LONG LIFE REDUCES MAINTENANCE COSTS
- LOWEST TRUE COST
- DESIGNED TO YIELD YOU AN ADEQUATE RETURN ON YOUR INVESTMENT

MAGNOTRONIC 4000 hour Traffic Signal Lamps are available in wattages of 40, 60, 67, and 100. The same lamp with a designed life of 5000 or 6000 hours can be had at no extra cost.

A complete line of general service lamps designed for 2000 or more hours of service including STREET SERIES, MULTIPLE SERIES, SPOTLIGHT, FLOOD LIGHT and HIGH VOLTAGE SERVICE.

TECHNICAL KNOWLEDGE ACCUMULATED BY OUR LABORATORIES THROUGH YEARS OF PRACTICAL AND RESEARCH EXPERIENCE STAND BACK OF OUR PRODUCT.

COMPANY REPRESENTATIVES IN PRINCIPAL CITIES

INDUSTRIAL ELECTRONICS CORP.
80 BANK STREET, NEWARK 2, N. J.

A Deceleration Lane Study

By J. V. Miller Jr.

Highway and Traffic Engineer, George S. Richardson, Consulting Engineer, Pittsburgh, Pennsylvania

THIS study is a primary step toward determination of the type and lengths of deceleration lanes required for traffic leaving a freeway. Other more definitive studies must be made before a complete understanding of driver behavior upon leaving freeways can be obtained. The purpose of this study was to obtain empirical data of driver practices at a freeway exit where a full width deceleration lane of adequate length is provided.

Location of Study

A full width deceleration lane of sufficient length to allow drivers to move into the deceleration lane according to the dictates of their desires was required. The eastbound deceleration lane at the Breezewood Interchange of the Pennsylvania Turnpike was ideal for the study. This area of the Turnpike has free flowing traffic, a full width deceleration lane 1200 feet long, and a cut slope of ten or more feet in height paralleling the deceleration lane on the same side of the roadway. The high bank provided good vantage points where observers could work unseen by motorists. Fig. 1 shows a view of the location.

The grade prior to the study area is +3%. At the end of the study area, the grade is +1.1% and the 1200 feet feet of the study area are on a 1200 foot vertical curve between the two grades.

Method of Study

The deceleration lane area was divided into four zones as shown in Fig. 2. Each zone contains four pavement sections and is approximately 300 feet long. Speed was observed by timing the vehicle over the entire length of each zone. The average speed of each vehicle through each zone was thereby determined. Placement observations were made at the construction joint between the two middle pavement sections of each zone, which is at the approximate midpoint of each zone. Placement values were taken at the distance of the right front wheel of the vehicle from the edge of the deceleration lane. The recorder and observers maintained contact by telephone.

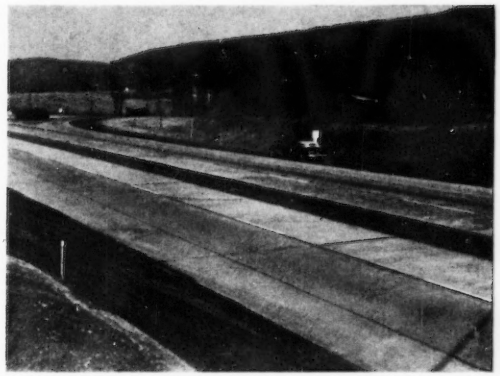


Fig. 1
View of the deceleration lane under study taken from the far side of the roadway.

Only free flowing passenger vehicles leaving the freeway at this exit were observed. The study was conducted on the 24th and 25th of March and the 8th of April, 1951. Traffic volume on these three days was greater than average daily traffic but was still free flowing. Only about 20% of the off vehicles were affected by stream friction and these vehicles were disregarded.

Analysis

The Average Off Movement

The data obtained are analyzed in two major divisions. The first analysis is the determination of the *average* off movement; the second is an analysis of individual off movements. The first analysis was made by obtaining the mean value for speed and placement of all observed vehicles at the center of each zone. The mean values are shown in Fig. 3. To obtain these means, the values used for individual speeds and placement were as accurate as the data would permit—3 feet for placement and 5 miles per hour for speed.

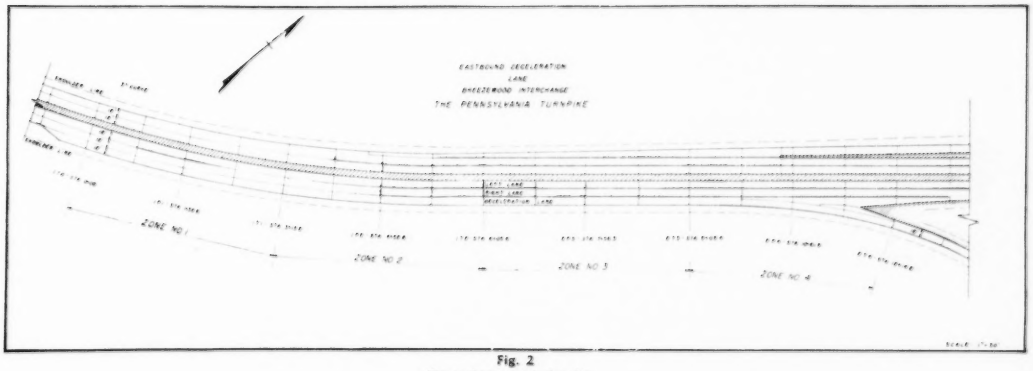


Fig. 2
Plan view of study site.

Mean Values of Speed and Placement for All Observed Vehicles

	Zone 1	Zone 2	Zone 3	Zone 4
Speed MPH	47	45	41	35
Placement, feet	14	10	6	3

Fig. 3

It should be borne in mind that Fig. 3 is not representative of the off movement itself. For example, in comparing the change in speed and lateral placement between zones 1 and 2 against that in zones 2 and 3, the following differences were found: 58% of the 300 drivers had a difference in the two changes in lateral placement of 3 feet or more; 52% had a difference of 4 feet or more; 50% had a difference greater than 5 mph in deceleration from zones 1 to 2 as compared with that from zones 2 and 3.

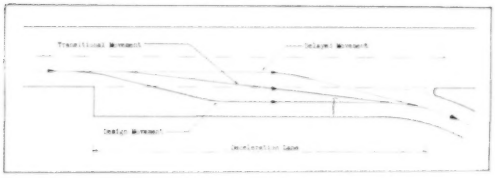


Fig. 4

Anticipated general categories of the off movement under study.

Individual Off Movement

An original hypothesis for this phase of the analysis was that the off movement would fit into one of three general categories with respect to placement. Fig. 4 is a pictorial representation of these three categories. To identify each off movement into one of these three categories, a six foot range or class interval was utilized. Range A, from 1 to 6 feet, denotes a vehicle entirely within the deceleration lane and is the only range in which an off vehicle will not cause stream friction with through vehicles. From 7 to 12 feet, range B, a vehicle is straddling the deceleration lane and the right lane; i.e., it is partially occupying both the lanes. A vehicle entirely within the right lane falls into range C, from 13 to 18 feet. A vehicle straddling the right lane and the left lane is therefore in range D, from 19 to 24 feet.

A speed range of 10 miles per hour was used for this analysis. Range 2 is from 20 to 29 miles per hour and, similarly, for the other ranges, the range number indicates the first digit in the speed.

The individual off movements were then analyzed on the basis of these ranges of 6 feet and 10 miles per hour. The resulting summation of individual off movements with respect to speed ranges in each zone is shown in Fig. 5. Fig. 6 is the summation of the individual off movements classified by the placement ranges.

Also found in Fig. 6 is the classification of the individual off movements, with respect to placement ranges, into the three general movements. Any vehicle which has entered range A by the time it reaches joint 1P2, in zone 2, is classified as a design movement. Eight of these vehicles re-enter range B in zone 3; however, seven of these only went to seven feet and the other to eight feet. In spite of this slight infringment on range B these vehicles should be considered in the design movement because of their early use of the deceleration lane. The transitional movement contains all vehicles in range A beginning at joint 2P3 or in range B in both zone 2 and zone 3. Those in C and D at joint 1P2, in zone 2, constitute the third general category, the delayed movement.

In accord with the aforementioned criteria, the design movement was made by 29 per cent of the drivers, the

Off Movements Classified By Speed Ranges

Zone 1	Zone 2	Zone 3	Zone 4	Number of Off-Vehicles
6	5	5	4	6
5	5	5	4	10
5	5	4	4	18
5	4	4	4	8
5	5	4	3	26
5	4	4	3	14
5	4	3	3	5
4	5	4	4	4
4	5	4	3	5
4	4	4	4	15
4	4	4	3	56
4	4	3	3	46
4	3	3	3	11
4	4	3	2	13
3	4	3	3	5
3	3	3	3	17
3	3	3	3	9

Less than 5 off vehicles not shown.

Key: 6—60-69 mph.
5—50-59 "
4—40-49 "
3—30-39 "
2—20-29 "

Fig. 5

Off Movements Classified by Placement Ranges

%		Zone 1	Zone 2	Zone 3	Zone 4	Number of Off Vehicles
	Design Movement	A	A	A	A	12
		B	A	A	A	54
		C	A	A	A	14
		B	A	B	A	5
29		C	A	B	A	3
	Transitional Movement	B	B	A	A	22
		C	B	A	A	67
		D	B	A	A	3
		C	C	A	A	10
		B	B	B	A	6
45		C	B	B	A	28
	Delayed Movement	C	C	B	A	52
		D	C	B	A	1
		D	D	B	A	1
		E	D	B	A	1
		C	B	C	A	1
		C	C	C	A	18
		C	C	B	B	1
25		C	C	D	B	1

Fig. 6

transitional movement by 45 per cent, and the delayed movement by 25 per cent. This means that almost one of every three drivers, with respect to placement, used the lane similar to the manner in which the designer intended it to be used. An additional one out of every three were in the deceleration lane for the last 400 feet of deceleration lane.

No clearly defined correlation between speed and placement was found in this study. Fig. 7 shows the results of an attempt to correlate speed ranges in zones 1 and 4 with the three general types of off movements.

The design movement has a lower percentage in the five range and a higher percentage in the three range than either the transitional movement or the delayed movement, for zone 1 speed ranges. Other than this fact there is little to be gained from any further analyzing of the figure. This one fact alone is insufficient as a basis for establishing any definite relationship between speed and placement.

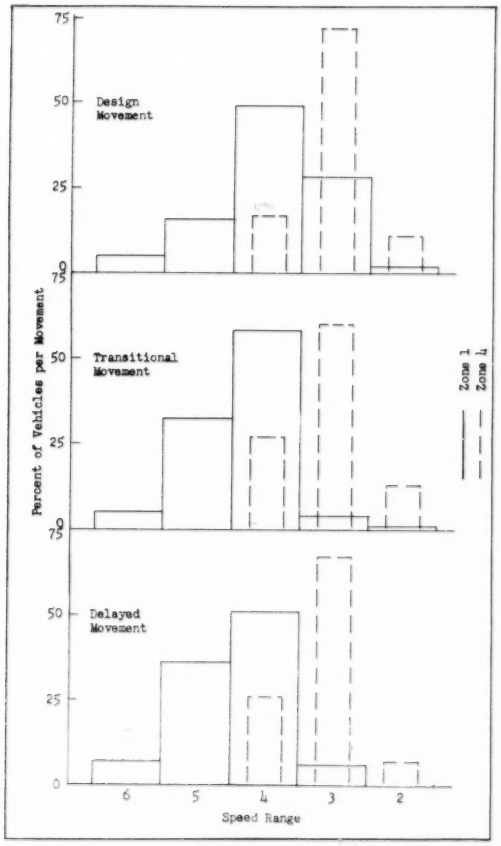


Fig. 7
Zone 1 and Zone 4 speed range percentages by movements.

Conclusions

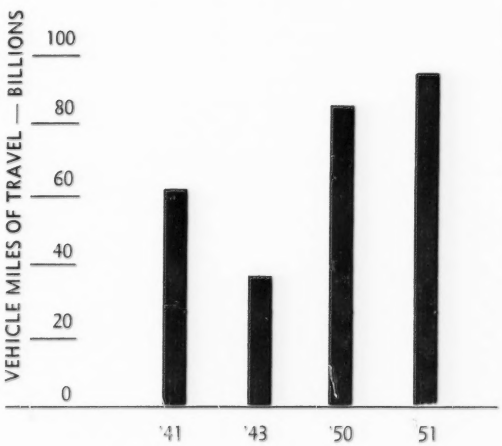
The conclusions of this study are limited by the conditions under which the study was made and by the physical characteristics of the study site. No attempt to use these conclusions as general rules should be made. Their application to situations different from the aforementioned is not practical without additional study and field work.

Further studies should be conducted to determine the effect of (1) stream friction and traffic pressure on the off movements; (2) night performance; (3) the various types of tapers, lengths, etc., of deceleration lanes; and (4) effect of advance warning signs, and other pertinent factors.

It has been said that, with free flowing traffic, the "extra lane" type of deceleration lane would not be used sufficiently to justify its cost. This statement was not borne out by the study. Almost one out of every three off vehicles use the design movement, or in other words, use the "extra lane" in the manner for which the designer intended it to be used. In addition, a much greater percentage of the off passenger vehicles not included in this study (because they were not "freeflowing") seemed to use the design movement in leaving the Turnpike.

This article is based on Mr. Miller's student thesis research while he was a student at the Yale Bureau of Highway Traffic during the academic year 1950-51.

Traffic Trends



TRAVEL ON RURAL ROADS FOR FIRST FIVE MONTHS OF 1941, 1943, 1950 and 1951.

Based on Bureau of Public Roads Data

TRAFFIC NEWS

Yale Awards Fellowships In Traffic Engineering

Fifteen graduate engineers from 12 states have been awarded fellowships and scholarships for study in Yale University's Bureau of Highway Traffic during the academic year 1951-52.

The names of the award winners, selected by Yale's Committee on Transportation, were announced recently by Theodore M. Matson, Director of the Bureau of Highway Traffic.

The Bureau, established at Yale in 1938, is a center of graduate training and fundamental research in highway matters. Each year it trains a group of 20 to 35 men for a professional career in highway operations and traffic engineering.

Nine of the fellowships, sponsored by the Automotive Safety Foundation, were awarded to the following:

Max N. Clyde, Highway Traffic Engineer, Planning and Traffic Division of the Michigan State Highway Department;

William R. Curry, Traffic Engineering Division, Washington Department of Highways in Olympia;

John V. Exnicios, Assistant Traffic Engineer, City of New Orleans, La.;

Robert A. Keith, Jackson & Moreland, Consultants, Boston, Mass.;

Yoshio Kosai, Senior Engineer Aide in Traffic Engineering, Washington State Highway Department in Seattle;

Herbert S. Levinson, Junior Traffic Engineer, Chicago Park District;

John I. Logan, Assistant District Traffic Engineer, Massachusetts Department of Public Works;

Bruce B. MacDonald, Junior Civil Engineer, New York State Department of Public Works in Buffalo;

Joe F. Rice, Highway Traffic Engineer, Traffic Division, Kentucky State Highway Department.

The Gordon Cass Memorial Fellowship was awarded to Alan M. Voorhees, City Planning Engineer, Colorado Springs, Colo.; and the Rand McNally Fellowship was awarded to Alfred K. Goldin, Associate Highway Engineer, California Division of Highways in Los Angeles.

Four tuition scholarships made available by Yale University were awarded to Theodore E. Brenner, Atlantic Highlands, N. J.; Paul H. Fowler, Linden, Calif.; Albert M. Greenblatt, St. Louis, Missouri; and Allan L. Strane, St. Paul, Minn.

The eleven fellowships provide stipends of $1,400 each and enable the recipients to engage in a full academic year of graduate study and research in traffic engineering.

Preference in the award of the Automotive Safety Foundation Fellowships is given to men employed in street and highway engineering. The Gordon-Cass Memorial Fellowship, sponsored by the American Transit Association, is designated for an individual especially interested in urban transportation problems, while the Rand McNally Fellowship is given to an engineer employed by a city or state highway department.

YIELD Signs in Providence, R. I.

The Traffic Department of the City of Providence, R. I., recently issued a statement concerning the use of "YIELD Right of Way" signs. Dwight T. Myers (Mem., ITE), Traffic Engineer, stated that: "It is our intention, by the use of the 'YIELD Right of Way' signs to provide a measure of control at intersections which do not warrant full STOP control. It will not be necessary for a motorist approaching a 'YIELD Right of Way' sign to bring his vehicle to a full stop regardless of traffic and visibility conditions, as is now the case with a STOP sign."

Mr. Myers further stated that "It is the responsibility of the motorist approaching a 'YIELD Right of Way' sign to have his vehicle under such control that it will not interfere with or collide with any vehicle or pedestrian on the intersecting street. The driver who fails to yield right of way to a vehicle or pedestrian and interferes with their movement or collides with them is immediately subject to arrest for a violation of this regulation."

The Providence regulation governing the control of traffic at a "YIELD Right of Way" location is as follows:

The driver of a vehicle approaching a "YIELD Right of Way" sign shall slow to a reasonable speed for existing conditions of traffic and visibility, yielding right of way to all vehicles and pedestrians on the intersecting street which are so close as to constitute an immediate hazard.

The driver of any vehicle proceeding past "YIELD Right of Way" sign facing the vehicle, and who interferes with or collides with the movement of any vehicle or pedestrian proceeding on the intersecting street shall be deemed prima facie in violation of this regulation.

Mackall Promoted to Vice-President

KENNETH W. MACKALL was recently appointed Commercial Vice-President in charge of Traffic Signals of the Crouse-Hinds Company in Syracuse, New York.

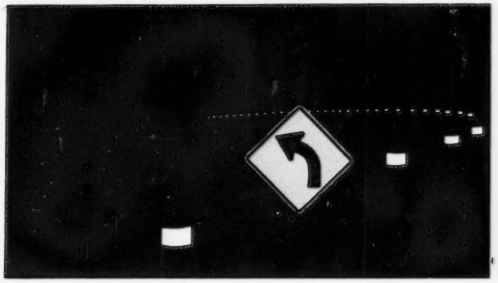
Mr. Mackall has been with Crouse-Hinds for the past thirty-six years, handling first headlights for trolley cars and mining locomotives, then floodlights and airport lighting equipment, and finally traffic signals. Prior to taking a position with Crouse-Hinds he was on the General Electric test force at Lynn and Pittsfield, Massachusetts, from 1911 to 1915. He is a graduate of Virginia Polytechnic Institute, Blacksburg, Virginia, and received a degree of Bachelor of Science in Electrical Engineering.

He has been a Member of the Institute of Traffic Engineers since 1931. He is also a member of the Illuminating Engineering Society and the International Municipal Signal Association.

How "SCOTCHLITE" Sheeting helps you serve the public

Say "WELCOME" to visitors with SIGNS YOU CAN SEE DAY AND NIGHT!

BEAUTIFUL BY DAY! Vacationers will find real pleasure in touring the area you serve—if highways are clearly marked with "SCOTCHLITE" Reflective Sheeting. They'll travel in *safety*, too, for these SIGNS YOU CAN SEE give instant warning of intersections, overpasses, curves and bridge abutments.



SAFE BY NIGHT! Headlight beams light up these powerful reflectorized signs and warning markers in full color brilliance! Reflecting the same size, same shape, as during daylight hours, they give the *extra* measure of protection that could spell the difference between a happy vacation and a tragedy.

VACATION DAYS bring more people, more business into the area you serve. Highways that are clearly—*safely*—marked with "SCOTCHLITE" Sheeting will help to bring them back next year! "SCOTCHLITE" Sheeting meets specified requirements for outdoor safety signs.

IMPROVE THE SAFETY OF YOUR STREETS AND HIGHWAYS with signs of "SCOTCHLITE" Reflective Sheeting. For complete information on how these signs can help you serve the public, write today to Dept. TE81, Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Safety-Walk" Non-slip Surfacing, "3M" Abrasives, "3M" Adhesives. General Export: Minn. Mining & Mfg. Co., International Division, 270 Park Avenue, New York 17, N. Y. In Canada: Canadian Minnesota Mining & Mfg. Co., Ltd., London, Canada.

Traffic Institute Chosen To Develop Traffic Plan For Civil Defense Action

Northwestern University's Traffic Institute has been selected by the Federal Civil Defense Administration to develop a nationwide traffic control training program for civil defense emergencies.

The announcement was made by Millard Caldwell, Federal Civil Defense Administrator, and Dr. J. Roscoe Miller, president of Northwestern University.

The contract states that the Traffic Institute will "conduct the necessary research and prepare the information and materials necessary to provide and adminster a program to train state and municipal police and qualified civil defense workers in the United States in the regulation and control of street and highway traffic for civil defense."

The first course probably will be offered next fall.

Two New One-Way Streets in New York City

First and Second Avenues in New York City were converted into one-way traffic arteries between Houston Street and 125th Street, on June 4, 1951. First Avenue carries northbound traffic and Second Avenue southbound traffic.

This is the first pair of major avenues on Manhattan's East Side to be selected for one-way operation and marks another step in the Department of Traffic's long-range program for converting major north and south avenues in Manhattan to one-way operation and the modernization of the traffic signal system. The first pair of such avenues chosen on the West Side was Ninth and Tenth Avenues, where one-way movement has proven highly satisfactory.

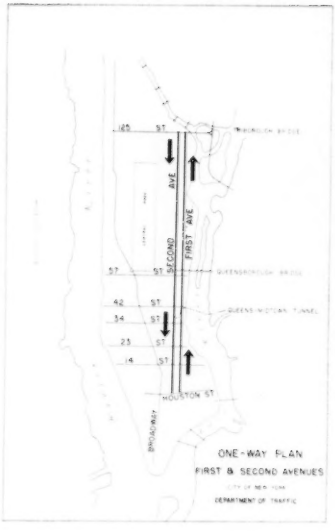
The past running time of 30 minutes to cover the 6¼ mile distance along First and Second Avenues has been reduced by approximately 20%. A further 20% reduction in the running time resulted with the installation of a progressive signal system on the two thoroughfares, which brought the running time down to 18 minutes. Installation of the new signal system was completed shortly after the inauguration of the one-way operation.

Trucks 25% of Traffic

The composition of traffic on First and Second Avenues, it was pointed out, is somewhat similar to that on Ninth and Tenth Avenues, where one-way operation and progressive signalization has improved traffic movement considerably. However, there is a smaller proportion of trucks on First and Second Avenues, amounting to 25% of the total traffic, as compared to 40% on Ninth and Tenth Avenues. In addition, loading and unloading activities at the curb are not as intense on First and Second Avenues as they are on Ninth and Tenth Avenues. These factors would indicate that the results obtained on First and Second Avenues through one-way operation and improved signalization were even better than on Ninth and Tenth Avenues.

Installation of one-way traffic movement on the two avenues required the erection of approximately 500 one-way arrow signs, as well as a number of guide signs to properly route traffic at such facilities as the Queensboro Bridge. Synchronous controllers were installed at intersections not already so equipped along First and Second Avenues.

The progressive signal system provides for continuous movement of traffic on First and Second Avenues at a prescribed speed of 22 miles an hour. This improvement is not only advantageous to the avenues because of elimination of present stops, but it also improved traffic movement on all the intersecting cross streets. A shortened signal cycle from the present 90 seconds to 60 seconds reduced the waiting time for both vehicles and pedestrians to cross. The number of green periods for both vehicles and pedestrians crossing these two avenues at intersections were increased from the present 40 to 60 per hour. The shorter green period induced better observance of the signals by pedestrians and enhanced their safety. This resulted in a reduction in accidents.



250 Intersections To Be Controlled

First and Second Avenues have a total of 250 intersections which are thus controlled. Of these, 114 have been equipped with synchronous controllers. This left 136 intersections to be equipped under a contract which was awarded recently.

In addition to the installation of new signal controllers, it was necessary to install additional signals at 14 intersections on First Avenue between 11th and 124th Streets. These intersections are now equipped with only a single signal post, containing one signal indication for each direction. While this arrangement is barely adequate for the present simultaneous signal operation, it is felt it would be hazardous to attempt progressive operation without additional signals at these locations. Conduit and foundations already are in place for these signals and all that remains to be done is to erect the posts and make the necessary electrical connections. A contract for this work also was issued and an effort will be made to have the work completed within the very near future.

Left Turn Conflicts Eliminated

A 20% reduction in the running time along First and Second Avenues was effected by the mere conversion of these thoroughfares to one-way operation, even under the simultaneous signal system. The primary reason for this reduction was the elimination of left turn conflicts. Another factor in the improvement is the elimination of friction between opposing movements of traffic.

Road Map Costs In Kentucky

The Court of Appeals of one state having a constitutional amendment prohibiting diversion, has held that the printing and distribution of road maps, bulletins, etc., can be paid out of highway funds, reversing the ruling of a lower court. The Kentucky Court of Appeals held that these costs are included in the broad category of administration and maintenance of highways. "The fact that these maps are gotten up . . . to attract tourists, as well as to help them . . . does not prevent the maps from being a proper charge against the road fund."

Secretary's Column

At the April Board Meeting a committee was appointed by President Neal to study the *Institute's* grades of membership and to compare them with those of similar professional organizations. This committee, after extensive deliberation, recommended a new grade of membership, not to be intended for individuals but, rather, for organizations or departments and to be called *Sustaining Organizations*.

There are no provisions for *Sustaining Organizations* in the present Constitution and By-Laws. This new grade may be established, therefore, only through constitutional amendment.

At its June meeting, the Board proposed, by resolution, to amend the By-Laws of the *Institute* through the creation of a new Article to read as follows:

Sec. 1—Any firm, association or corporation desirous of aiding the *Institute* and furthering its objectives may become a *Sustaining Organization* upon invitation of the Board of Direction and payment of a minimum of $100 per annum.

Sec. 2—A *Sustaining Organization* may designate one representative to be listed in the *Institute's* yearbook. This representative may take part in all activities of the *Institute* except to vote and hold office. This representative shall receive the *Institute's* current publications available on membership or subscription basis.

Sec. 3—A *Sustaining Organization* may designate up to three individuals to serve in advisory capacities with various technical committees of the *Institute* but not more than one individual may be designated to serve on any one committee.

Sec. 4—Upon receipt of payment, and in due course, the *Institute* shall present to the *Sustaining Organization* an official certificate with the *Institute's* seal, bearing the signatures of the President and Secretary-Treasurer, and the effective year.

Sec. 5—Upon information coming to its notice, the Board of Direction may refuse to accept the support, or continued support, of a *Sustaining Organization* at any time after giving due notice and opportunity to be heard if desired.

This amendment will be submitted to the voting membership prior to the Annual Business Meeting in Los Angeles on September 24th. It will be discussed at the Business Meeting and could be revised by majority vote at that time. Final adoption will depend upon the results of a canvass of voting members, by mail, following the Annual Meeting.

Fred W. Hurd

New Members

BOUMAN, MARTIN J. (Jun.)
Civil Engineering Assistant
County of Los Angeles Road Department
Traffic Division
Los Angeles, California

CLAIRE, WILLIAM H. (Assoc.)
Planning Architect
Community Redevelopment Agency
SEND MAIL: 44 East Foothill Boulevard,
Altadena, California

CLEVELAND, DONALD E. (Jun.)
U. S. Army
SEND MAIL: 2224 North 57th Street
Seattle 3, Washington

CLINARD, CHARLES A. (Jun.)
Lt. (j.g.) USN
USS Nipmuc (ATF 157)
% Fleet Postmaster, New York
New York

COLBY, EDWIN F. (Jun.)
Jr. Highway Engineer
State Highway Department
Olympia, Washington

FAHEY, GEORGE E. (Assoc.)
Engineering Aid V, County of Los Angeles
Road Department
Los Angeles, California

FREDRICKSON, CHARLES B. (Jun.)
Traffic Engineer II
Bureau of Street Traffic
Chicago, Illinois

HALEY, CHARLES E. (Jun.)
Assistant Traffic Engineer
City of Phoenix, Arizona

MARCONI, WILLIAM (Jun.)
Assistant Engineer I, Traffic Section
Department of Public Works
San Francisco, California

McDONALD, JOHN W. JR. (Jun.)
1st Lt., Hq. Air Res. & Dev. Command
Baltimore
SEND MAIL: 610 Cathedral Street
Baltimore, Maryland

NADON, JOSEPH D. JR. (Jun.)
Traffic Engineering Aid II
Pima County and City of Tucson
SEND MAIL: 2449 South Treat Avenue
Tucson, Arizona

PERDEW, HARLAN F. (Assoc.)
Sr. Highway Engineer
State of California, Div. of Highways
Sacramento 17, California

PHILPOTT, ARTHUR B. (Jun.)
Traffic Analyst
San Jose Police Department
San Jose, California

SKILES, GERALD W. (Assoc.)
Asst. District Traffic Engineer
California Div. of Hwys., District VII
SEND MAIL: 11260 Blix Street
North Hollywood, California

STEVENSON, WADE (Affil.)
President
Eastman Machine Company
779 Washington Street
Buffalo 3, N. Y.

VOORHEES, SHERMAN P. (Affil.)
Executive Director
Future Springfield, Inc.
86 Hillman Street
Springfield 3, Massachusetts

WAGNER, PAUL I. (Mem.)
District Traffic Engineer
California Division of Highways
District V
50 Higuera Street
San Luis Obispo, California

Transfer

BARKAN, BENEDICT G.—Junior to Associate

Effective Administration In State-City Highway Activity

Criteria of Sound Administration; A Policy on State-City Relationships, by Norman Hebden. Yale University, Bureau of Highway Traffic, 1951. 107pp. $2.00.

A growing recognition of the need for more adequate legislation and improved administration in relationships between states and cities in highway affairs should lead to a wide use of this timely discussion of those matters. This latest volume by Mr. Hebden contains a careful analysis of the essentials of effective administration and sets forth a comprehensive system of state-city relationships.

The book supplements "State-City Relationships in Highway Affairs," by Norman Hebden and Wilbur S. Smith, published last year and reviewed in the September, 1950 issue of "Traffic Engineering." That volume dealt with intergovernmental relationships in effect in a dozen states and analyzed the strength and weaknesses of current practice. These reports are the result of more than two years' study of the administrative problems of highway planning and engineering, carried on with the aid of a grant from the Alfred P. Sloan Foundation.

In contrast to the long-established analytical procedures and objective standards applied in highway engineering, and even the profit measuring-rod of private industry, the techniques of evaluating administration in public enterprise are as yet in the rudimentary stage of development. Nevertheless, the author maintains, some criteria of effective accomplishment should be set up and applied to administrative procedures.

Mr. Hebden lists nine criteria of sound administration:

1. *"The Criterion of Organization*—To ensure the adequacy of an organization, and to attain effective intergovernmental coordination, requires an analysis of the *whole* problem at hand, followed by the determination and assignment of functions, applying the principle of specialization..

2. *The Criterion of Perspective*—Achievement of the highest degree of highway service has as a prerequisite the acquisition of a broad perspective of the entire problem through the development of a comprehensive, long-range plan to meet foreseeable needs.

3. *The Criterion of Programming*—To satisfy the over-all, comprehensive needs requires *continuous* advance planning, the scheduling of work over a specified period of time in accordance with a financial plan, and a periodical renewal of the program.

4. *The Criterion of Uniform Policies and rocedures*—The formulation of comprehensive policies and working procedures, uniformly executed, is indispensable to the development of harmonious state-city relations.

5. *The Criterion of Standards*—The establishment of uniform design and other technical standards representative of best practice is essential to efficient, safe highway service.

6. *The Criterion of Administrative Supervision*—State participation and aid in urban highway work demands the exercise of competent administrative supervision to assure accomplishment of plans and projects.

7. *The Criterion of Communications*—Improved state-city relationships materially hinge upon the exploitation of every conceivable means to establish close, frequent contact between the states and cities at all levels of operation.

8. *The Criterian of Cooperation*—The spirit of working together toward a common objective and the utilization of the knowledge and experience of *both* state and city officials are keys to close, cooperative endeavor.

9. *The Criterion of Responsibility and Authority*—Clearly defined, clean-cut assignment of responsibility, with commensurate authority, is essential to sound state-city relations."

The list of criteria is followed by the development of a framework of a comprehensive policy on state-city relations in highway affairs. The suggested system of relationships is outlined under several major segments of the problem: (1) basic development plan and standards, (2) responsibility and authority, (3) urban highway system designation, (4) organizational requirements, (5) programming, and (6) cooperative working procedures.

The principles outlined declare, in brief, that "the state should determine the full scope of its highway problem and should formulate a long-range development plan; the state should establish uniform design and other technical standards; the state should review and revise its highway laws, where necessary, to define clearly state responsibility for urban work and to provide the broad authority necessary to enable the state and cities to discharge their respective responsibilities; the state and cities should jointly determine an urban highway system; the organizational structure of the state highway department and of each city should be examined, and modified where necessary, to assure that joint highway activity can be conducted effectively; the state and cities should develop a sound, continuing long-range programming procedure for highway improvements, and the state should establish comprehensive, uniform working procedures for the conduct of joint urban highway activity."

The discussion which follows is an elaboration of the criteria and policies proposed in the recommendations. Briefly, but explicitly, Mr. Hebden points out places where improvement is possible in the many phases of highway administration involving relationships between states and cities.

The book is short. It was written for the busy highway administrator and legislator to serve as a guide to the most urgent legislative and administrative needs in this new area of responsibility for highway matters of joint interest.

1951 ITE Annual Meeting

September 23-27

Los Angeles, California

Ambassador Hotel

Make your plans *now* to attend this worthwhile and enjoyable affair.

New Honorary Member

SIDNEY J. WILLIAMS, Assistant to the President of the National Safety Council, Chicago, Illinois, newly elected Honorary Member of the Institute of Traffic Engineers, was born in Milwaukee, Wisconsin. He was graduated from the University of Wisconsin with a B. S. in general Engineering in 1908 and a C. E. degree in 1915.

Mr. Williams joined the National Safety Council staff as Chief Engineer in 1918 and in 1924 he was made Director of the Public Safety Division. He became General Manager in 1944 and Assistant to the President in 1945.

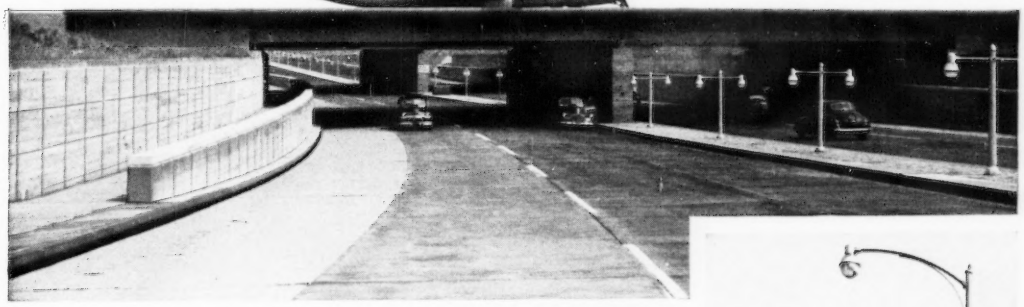
In 1938 Mr. Williams received the C.I.T. Safety Foundation grand award for the greatest contribution to public safety during the year, and recently was named Beecroft Memorial Award lecturer for 1950 by the Society of Automotive Engineers.

Mr. Williams attended the now famous Pittsburgh meeting on October 2, 1930, at which time the Institute of Traffic Engineers was organized; he is a charter member and served for four years (1933-1937) as Director.

His many important and varied projects include the President's Highway Safety Conference; the National Committee on Uniform Traffic Laws; the President's Conference on Industrial Safety; and the Federal Inter-departmental Safety Council (in this connection he was a White House consultant); he has written two books and several articles and has been very active in the field of public safety. He was unanimously elected as an Honorary Member of the *Institute* because of his outstanding achievements in the field of highway transportation.

In addition to his affiliation with the ITE, Mr. Williams is a member of ASCE, SAE, Western Society of Engineers, and the American Society of Safety Engineers.

No ceiling on safety here!



A Pan American World Airways Stratocruiser taxiing across Van Wyck bridge. Union Metal twin light steel poles light the underpass approach road.

World's largest commercial airport uses MONOTUBE LIGHTING POLES

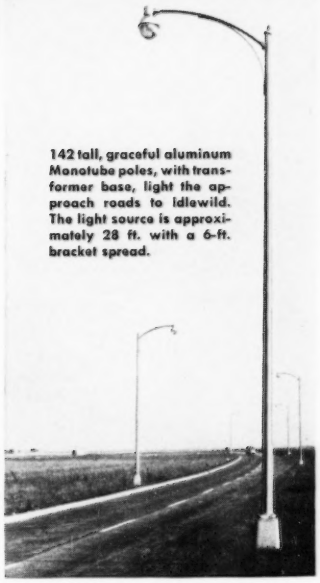
PROPERLY lighting the approach roads, underpasses, etc., at an airport is no "cinch job". Many factors must be considered—especially at a huge project like "Idlewild", the New York International Airport.

The engineers had a variety of problems to meet, but in every case Monotubes filled the bill. High and low poles, single and twin brackets, over 200 poles . . . some of steel, some of aluminum . . . all used to help give the safest and most efficient lighting to meet varying requirements.

Just as they do at "Idlewild", Monotube lighting poles successfully serve communities across the country—doing their share to help pedestrians and traffic be safer. They'll serve for years to come, because they're ruggedly built, require little maintenance.

If your community is planning to modernize street lighting, or light special areas, find out how much more efficiently and economically Monotubes can do the job. For information, write The Union Metal Manufacturing Co., Canton 5, Ohio.

UNION METAL
Monotube Street Lighting Poles



142 tall, graceful aluminum Monotube poles, with transformer base, light the approach roads to Idlewild. The light source is approximately 28 ft. with a 6-ft. bracket spread.

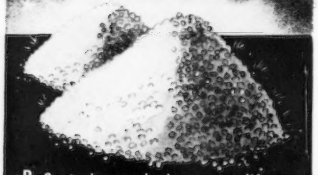
Fluted Monotubes, with twin brackets, greet visitors as they approach the Federal Building. Those flagpoles, too, are Monotubes, made of steel.

Let's reflect a moment...

SAVE TIME & MONEY USING THE

Cataphote

BEADED SIGN KIT



Reflectorize and give extra life to your signs at ½ the usual cost. A brand new, extra low cost, easy-to-apply method of reflectorizing your signs. No special equipment, no special training. Virtually foolproof. Now you can reflectorize your own signs in your own shop. Write for full info and prices.

Cataphote Corporation

TOLEDO 10, OHIO

Rush FREE descriptive pamphlet and full price list on CATAPHOTE Beaded Sign Kit and its low cost advantages to me:

Name_____

Title_____

City_____

State_____

MFRS. AGENTS INQUIRIES INVITED!

SECTION NEWS

Michigan Section

The Michigan Section of the Institute of Traffic Engineers held its annual outing at the Warren Valley Golf and Country Club in the City of Detroit. Golfing was enjoyed by those young enough to get around and the others were occupied with indoor sports. A chicken dinner was served to 45 members present at this meeting. Movies were shown by the Consumers Power Company of the process of constructing a new pipe line from Texas to Michigan.

I am happy to report that Member Frank C. Eisenach has been promoted from Traffic Control Engineer of the Michigan State Highway Department to Assistant Director in charge of Planning, second in command to J. C. McMonagle, Director of the Planning and Traffic Division.

Member Harold G. Bauerle was promoted from Traffic Design Engineer to Traffic Control Engineer in charge of traffic control and roadside design.

William Marvin, recently accepted as a junior member, has been transferred from the Lansing office of the Michigan State Highway Department to the Detroit office as Metropolitan Traffic Engineer.

Junior member Frederick I. Eggan has been promoted to become District Traffic Engineer at the Alpena office of the Michigan State Highway Department.

Reported by Samuel J. Levine
Secretary-Treasurer

Washington Section

Sixty-two members and guests of the Washington Section, ITE, met at the Naval Gun Factory, Officers' Club, in Washington, D. C., recently. This meeting was the Annual Meeting for the Section, and, in addition, it was held purposely during the President's Highway Safety Conference so that out-of-town members attending the conference would have an opportunity to get together and swap tales. All of those present arrived and enjoyed the "before dinner" refreshments provided for their pleasure. Bar-b-cued chicken was then served by the "Officers' Mess" following which President Wallace L. Braun called the meeting to order.

Mr. Braun introduced each visitor to the group so that all had an opportunity to see what the other fellow looked like under the "spotlight." The guest speaker of the evening was Harry Neal, our President, who gave a brief talk on current activities of the *Institute*. Joe Havenner from California then told of some of the highlights planned for the coming Annual Meeting in Los Angeles and urged all members to make every effort to attend because, as he said, "this meeting will be the greatest meeting of all."

Mr. Braun announced the new officers for the coming year, namely: Don Loutzenheiser, President; Buck Voltz, Vice-President; and Bill Heath, Secretary-Treasurer. The election was very smoothly carried out with no interference with the general meeting. The crowd then returned to the social aspects of the meeting and adjourned about 10:00 P.M.

Reported by William H. Voltz

Western Section

The Western Section's annual meeting is going to be held on September 23, in conjunction with the ITE annual meeting September 23 to 27. Our local arrangements committee has requested a solid Western Section attendance and to get your advance registrations in to the hotel NOW. The address is: Ambassador Hotel, 3400 Wilshire Boulevard, Los Angeles 5. Return your advance registration form that was mailed to you recently. Our local arrangements committee is planning an excellent technical session, as well as a well-rounded social program for ourselves and ladies. Put this on your agenda and have your secretary remind you of it *every* two weeks from now until September.

Guy McDonald has been away from the office due to illness but is now back on the job and feeling much better.

Announcements are out that Jim Reading's daughter, who you may remember as the girl who did considerable plugging for us in New York last

PARK-O-METER

The choice of men who have to solve city traffic problems

PARK-O-METERS HAVE BEEN CHOSEN BY MORE THAN 700 AMERICAN CITIES

because Park-O-Meter is the only truly modern meter which gives unfailingly dependable service throughout the changing years. Requires only a minute to set for any time or coin combination, or to convert from conventional reset to cumulative time operation. Furthermore, Park-O-Meter gains public acceptance because of simple, one-hand, automatic operation, the visual trouble signal, and the Coin-gate Block which prevents coin insertion when the meter is not in working condition.

the **ONE METER** *which meets* **EVERY** *operation need*

Parking meter operation needs vary within cities and change with time and experience. This meter . . . is readily convertible to these changing conditions . . . now and later.

Write for complete information

September, is to be married. I have not yet received an announcement, so I cannot give you any more definite details.

Bob Glenn reports from ITTE of a conference they held on intersection channelization and discussion presented by Eugene Maier, chairman, Highway Research Project Committee on Channelization. Bob forwarded to your secretary a copy of ITTE's informational circular No. 20 dated June, 1951, entitled "Reference Material on Intersectional Channelization." Copy of this can be obtained by writing directly to Harmer Davis, Director, ITTE, Room 114, Building T-11, University of California, Berkeley 4, California.

Reported by J. Al. Head
Secretary-Treasurer

LOOKING AHEAD

AUGUST 27-30, 1951—WASHINGTON, D. C.
Illuminating Engineering Society. National Technical Conference. Hotel Shoreham.

SEPTEMBER 9-13, 1951—POLAND SPRING, MAINE
International City Managers' Association.

SEPTEMBER 16-19, 1951—DETROIT, MICHIGAN
American Public Works Association. Public Works Congress and Equipment Show.

SEPTEMBER 17-20, 1951—SAN FRANCISCO, CALIFORNIA
56th Annual Meeting, International Municipal Signal Association, Inc. Mark Hopkins Hotel.

SEPTEMBER 23-27, 1951—LOS ANGELES, CALIFORNIA
Annual Meeting, Institute of Traffic Engineers. Ambassador Hotel.

OCTOBER 1-4, 1951—CINCINNATI, OHIO
American Transit Association. Annual Meeting. Netherland Plaza Hotel.

OCTOBER 8-11, 1951—BOSTON, MASSACHUSETTS
American Association of Motor Vehicle Administrators. 19th Annual Conference. Copley Plaza Hotel.

OCTOBER 8-12, 1951—CHICAGO, ILLINOIS
39th National Safety Congress and Exposition of the National Safety Council.

Centerlines take a beating but stay bright with "CATALITE"

paint · and · bead package for STREET and HIGHWAY STRIPING!

Literally millions of crystal clear reflective spheres embedded in a tough, highly reflective binder give matchless, all-weather performance. CATALITE is available in either "drop-on" or "premix". Send for information and low prices.

Cataphote Corporation
TOLEDO 10, OHIO

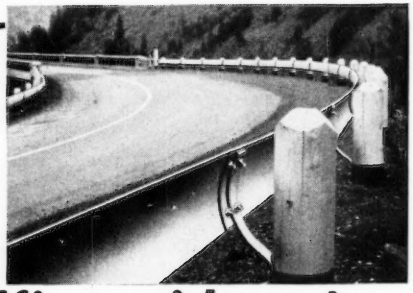
Please rush new FREE CATALITE descriptive pamphlet and prices of your three types of drop-on and also premix for street and highway safety striping. No obligation, of course,

Name_____
Title_____
City_____
State_____

MFRS. AGENTS INQUIRIES INVITED!

Exceeds all state safety specifications

TUTHILL HYWAY GUARD



cuts traffic accidents!

Write for technical brochure today!

Super-strong Hyway Guards safely deflect cars and cushion shock to vehicle, occupants and rail. Easily seen by day or night. Speedy, permanent erection with little or no maintenance required.

TUTHILL SPRING CO.
760 W. Polk Street, Chicago 7, Illinois

INDIANAPOLIS *buys 2,200 more* MARK-TIME manual parking meters

MARK-TIME proven performance wins *THIRD ORDER IN THREE YEARS*

On the basis of Mark-Time's top rating in two independent engineering surveys, Indianapolis made its first Mark-Time Parking Meter installation in 1949. Since then, in every weather, day after day, Mark-Time has patrolled the streets, easing traffic and providing welcome parking space. That's why, when it came to a vote, the order for 2200 *additional* Mark-Time "Hurricane" Manual Parking Meters was passed unanimously by the Board of Public Works and the City Council.

Such enthusiastic acceptance is positive proof that Mark-Time Manual Parking Meters have what it takes to please public and community alike. Dependable, damage-free performance. . . . Rock-bottom maintenance costs. . . . Efficient, simple operation . . . mean **BETTER** traffic-control, and **GREATER** revenue year after year. Whenever the facts are known . . . Mark-Time Manual Parking Meters are **FIRST** by far!

MARK-TIME

M. H. RHODES, INC.
HARTFORD, CONNECTICUT

Manufactured and sold in Canada by
Ontario Hughes Owens Co. Ltd., of Ottawa, Ontario

KARPARK

MEETS THE SPECIAL NEEDS OF EVERY CITY WITH THE RIGHT METER FOR THE PURPOSE

The "First Family" of Parking Meters

WRITE FOR FULL DATA TO THE KARPARK CORPORATION, CINCINNATI 6, OHIO

THE WISE CHOICE

The Steel Head
SUPERIOR
Supreme in strength; in resistance to damage and vandalism.

The Low Cost
HUSKY
Makes Karpark dependability available at a minimum investment.

The Versatile
TWIN-O-MATIC
One installation times two cars; has every wanted feature.

The Adaptable
UNIMATIC
Takes care of any parking situation—beautifully and efficiently.

LET'S BE HONEST

Every manufacturer of SIGNS is having trouble in securing ample steel supplies. It's no secret with us—WE'RE SHORT. We ARE making signs at no sacrifice in quality—not as many as we'd like—not enough to fill ALL orders promptly, but we are doing our very best. We will answer every inquiry with an honest report.

MANUFACTURED BY

MIRO-FLEX CO., INC.

1824 EAST SECOND STREET—WICHITA, KANSAS

MI·CO
PARKING METERS

•OUT-WORK
•OUT-LIVE
•OUT-EARN
many other types!

The record of MI-CO Parking Meters speaks for itself. We do not ask you to buy on unsubstantiated claims, or alone on the results of laboratory tests. We submit records of on-the-street performance over many years—under all conditions—from Alaska to Florida. It is upon these records we base our claim that MI-CO Parking Meters *out-work, out-live* and *out-earn* many other types.

MI-CO construction is unusually rugged, with moving elements reduced to a minimum. In some models there are only six moving parts. Contrast this with the delicate, intricate mechanism in other meters, and you get a pretty good idea why MI-CO maintenance is so low it's scarcely a consideration—why this meter has such a long and highly productive life, and why it is possible to easily and quickly service a MI-CO Meter should it need attention. What's more, the adjustment may usually be made in a few minutes right at the meter location.

Motorists like MI-CO's because they are thoroughly dependable. They know they will get all the time they pay for—no short changing—no fouled up mechanism or run down springs. MI-CO Parking Meters deliver full time, every time.

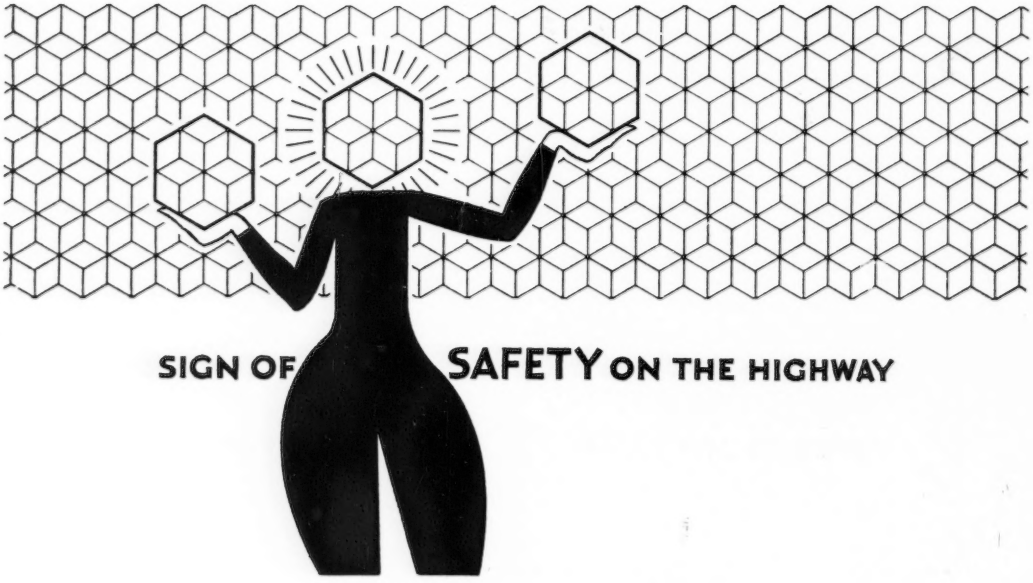
When you buy parking meters, buy on complete records. Ask especially to see five- to ten-year service records. These will show how well the meters hold up. We'll be glad to submit facts and figures on MI-CO's outstanding performance in hundreds of installations.

MI-CO METERS, 241 Court St., Covington, Ky.
Division of The Michaels Art Bronze Co., Inc.

stimsonite

TRADE-MARK ®

REFLECTORS



SIGN OF SAFETY ON THE HIGHWAY

A'G'A

TRADE-MARK

AMERICAN GAS ACCUMULATOR COMPANY

1027 NEWARK AVENUE, ELIZABETH 3, NEW JERSEY

A'G'A AIRPORT LIGHTING

A'G'A AGASTAT TIME DELAY RELAY

A'G'A STIMSONITE REFLECTORS

A'G'A MARINE LIGHTING EQUIPMENT

Professional Service Directory

RAMP BUILDINGS CORPORATION
PLANNING CONSULTANT
SINCE 1920
PARKING & AUTOMOTIVE SERVICE FACILITIES
MUNICIPAL PROGRAMS PRIVATE PROJECTS
Surveys — Reports — Design — Economics — Finance — Appraisals
230 Park Avenue :: New York 17, N. Y.

JENKINS, MERCHANT & NANKIVIL
Consulting Engineers
Municipal Improvements Sewerage
Power Development Water Systems
Traffic Surveys Industrial Plants
Flood Control Recreational Facilities
Airports Investigations and Reports
805 East Miller Street
Springfield, Illinois

EDWARDS, KELCEY and BECK
CONSULTING ENGINEERS
Surveys — Reports — Economic Studies — Design — Supervision
Transportation — Traffic — Parking — Terminals — Port and Harbor Works
Highways — Expressways — Grade Separations — Tunnels
Bridges — Water Supply — Management
3 William Street, Newark 2, N. J. • 250 Park Avenue, New York 17, N. Y.

PARSONS, BRINCKERHOFF, HALL & MACDONALD
Engineers
Airports, Bridges, Tunnels, Highways,
Traffic & Transportation Reports
Subways, Foundations, Harbor Works,
Valuations, Power Developments,
Industrial Buildings,
Dams, Sewerage, Water Supply
51 Broadway, New York 6, N. Y.

GANNETT FLEMING CORDDRY and CARPENTER, INC.
---ENGINEERS---
CONSULTING SERVICES FOR TRAFFIC, PARKING and TRANSPORTATION PROBLEMS
City Planning — Highways — Bridges — Flood Control
Water Supply — Sewerage — Industrial Waste — Garbage Disposal
Appraisals — Investigations — Management
600 NO. 2nd STREET HARRISBURG, PA.
Pittsburgh, Pa. Scranton, Pa. Daytona Beach, Fla. Medellin, Colombia, S. A.

DE LEUW, CATHER & COMPANY
CONSULTING ENGINEERS
Transportation, Public Transit and Traffic Problems
Subways, Railroads, Industrial Plants
Power Plants, Grade Separations,
Expressways, Tunnels, Municipal Works
150 N. Wacker Drive, Chicago 6, Ill.
79 McAllister St., San Francisco 2, Cal.

PALMER AND BAKER, INC.
CONSULTING ENGINEERS
For Problems of Transportation
Subaqueous Vehicular Tunnels Rock Tunnels Utility Tunnels Bridges
Grade Separations Highways Airports Traffic Studies
Parking Problems Waterfront and Harbor Structures
Complete Material, Chemical and Soils Laboratories
MOBILE, ALABAMA HOUSTON, TEXAS

YOUR CARD
could be set in this space at a very reasonable rate.
If interested, please write:
TRAFFIC ENGINEERING
211 Strathcona Hall
New Haven 11, Connecticut

Index to Advertisers

The revenue derived from the sale of advertising space assists the **Institute** in publishing TRAFFIC ENGINEERING on a regular monthly basis. The manufacturers listed below will be glad to cooperate with products and services which will be helpful to you in developing your traffic engineering and public improvement program.

AMERICAN GAS ACCUMULATOR CO. 392
AUTOMATIC SIGNAL COMPANY..... 357
CATAPHOTE CORPORATION..... 386 & 388
CROUSE-HINDS COMPANY..... 358
DUAL PARKING METER COMPANY..... 360
GENERAL ELECTRIC COMPANY.... 4th Cover
GROTE MANUFACTURING CO. .... 2nd Cover
INDUSTRIAL ELECTRONICS..... 376
KARPARK CORPORATION..... 390
MAGEE-HALE PARK-O-METER CO. 387
MI-CO METER COMPANY 391
MINNESOTA MINING & MFG. CO. 381
MIRO-FLEX COMPANY..... 390
PRISMO SAFETY CORPORATION..... 362
M. H. RHODES, INC. 389
TUTHILL SPRING COMPANY..... 388
UNION METAL MANUFACTURING CO. ... 385

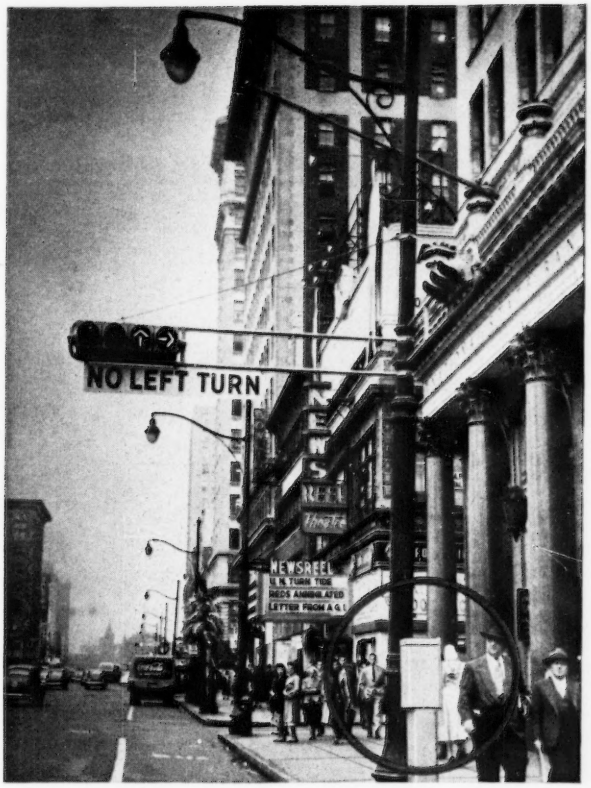
Type F Controller

PROVIDES FOR *ALL* YOUR TRAFFIC NEEDS!

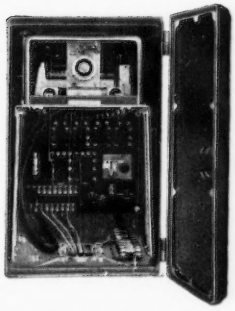
The G-E expansible Type F controller is universally applicable in the field of pre-timed traffic control, interconnected or non-interconnected. Simple addition of dial units and relays adapts the control to more complex traffic problems as the need arises.

Unitized construction of the timer and its dial units makes it easy to expand, install and maintain the Type F Controller. Moreover, simplified design and precision-built parts assure long, trouble-free life.

For more information about the G-E Type F Controller, write for Bulletin GEA-5481. Address your nearest Apparatus Sales Office or General Electric, Schenectady, New York.



Broad Street, Newark, New Jersey, has modern traffic control as exemplified by this G-E Expansible Type "F," the controller which can expand with traffic growth.



The Dial Units, Flasher and other major assemblies are jack-mounted for expansibility and accessibility. More and more communities are learning that the Type F Controller is just what they need for flexible traffic direction.

GENERAL ELECTRIC

453-55